

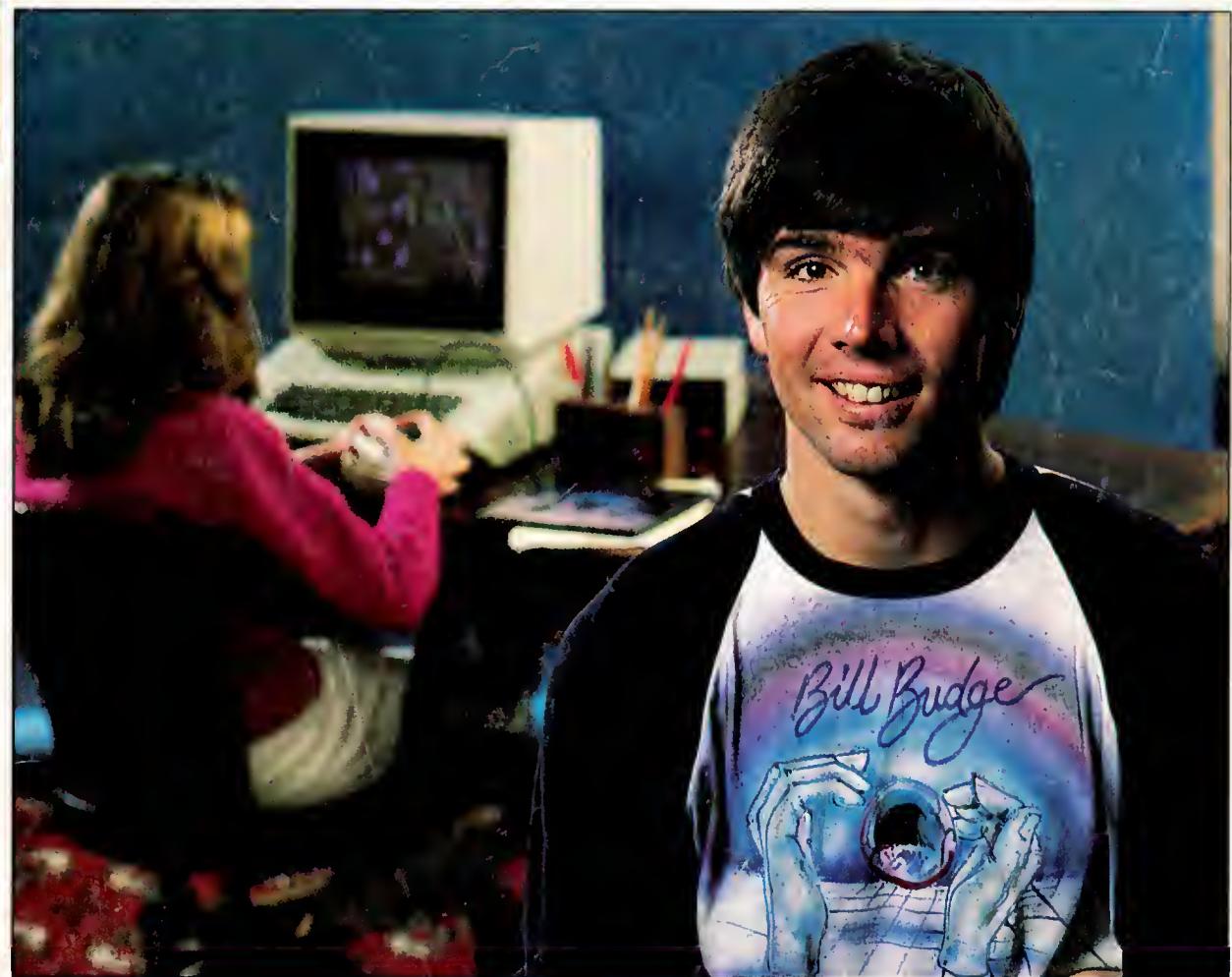
May 1984 USA \$2.95

# in Cider®

Green's Apple\* Magazine

Free Word Processor Inside!

## Bill Budge: Pinball's All-Time High Scorer



\*Apple® is a registered trademark of Apple Computer Inc.

Plus: Learn French with "Flashcards"

3-D Tick-Tack-Toe

A Program for Your One-Year-Old (Really!)



# Your Apple's telephone. Hayes



"Thanks for the prompt reply. Sure was a lot faster than waiting for the mail!"

"Gary: The pedigrees for next week's auction are as follows..."

"Attn. Prod., Sales, Purch.: Recommend 50% blue, 30% red screen for closest match."

**A complete plug-in communications system for Apple® computers.** From Hayes, the established telecomputing leader: the simple but sophisticated Micromodem IIe® plug-in board modem and its companion software, Smartcom I™. Everything you need to expand the world of your Apple II, IIe, II Plus and Apple III. In one, convenient communications package.

With Micromodem IIe and Smartcom I, you can access data bases, bulletin boards, and the varied resources of information services. Plan your travel itinerary via computer, including flight numbers, hotel and rental car reservations. Retrieve and analyze daily stock and options prices. Work at home and send reports to your office. You can even do your gift shopping by computer!

**Micromodem IIe. Think of it as your Apple's telephone.** It allows your computer to communicate with any Bell-103 type modem over ordinary telephone lines, at 110 or 300 bits per second. Micromodem IIe installs easily in an expansion slot, and requires no outside power source. It connects directly to either a single or multiline modular phone jack, to perform both Touch-Tone® and pulse dialing.

Micromodem IIe dials, answers and disconnects calls automatically. And, unlike some modems, it operates in full or half duplex, for compatibility with most time-sharing systems.

A built-in speaker lets you monitor your



calls when dialing. That way, you'll know if a line is busy. With Smartcom I, Micromodem IIe automatically redials your last number.

Discover how Micromodem IIe can help maximize the capabilities of your Apple. While Smartcom I software will minimize your efforts.

#### Smartcom I companion software. For effortless communications.

Whether you're a newcomer to personal computing or a seasoned professional, you'll appreciate the ease and speed with which you can perform any communications function. Thanks to Smartcom I!

Let Smartcom I guide you through a few easy-to-answer questions to tailor the program to your particular needs. Then you're ready to go!

Make a selection from the Smartcom I menu to manage your communications, files or printer. Program prompts guide you along the way. And menu selections let

you easily make a call, end a call, or answer a call. When you're on the receiving end, your Micromodem IIe answers automatically, even if you're not there!

Convenient! And so is the Smartcom I memory for phone numbers. Smartcom I stores three of your most frequently called telephone numbers and one prefix. Plus, it also remembers the last number dialed.

Smartcom I also provides a directory of the files stored on your disk. And lets you create, list, name, send, receive, print or erase files right from its menu.

Smartcom I is as versatile as you need it to be. It accepts DOS 3.3, Pascal, CP/M™ 3.0 or CP/M Plus™ operating systems. And accommodates up to six disk drives and several printer interface cards.

Like all our products, Smartcom I and

Micromodem IIe are backed by excellent documentation and full support. Including a two-year limited warranty on Micromodem IIe and a 90-day warranty on Smartcom I!

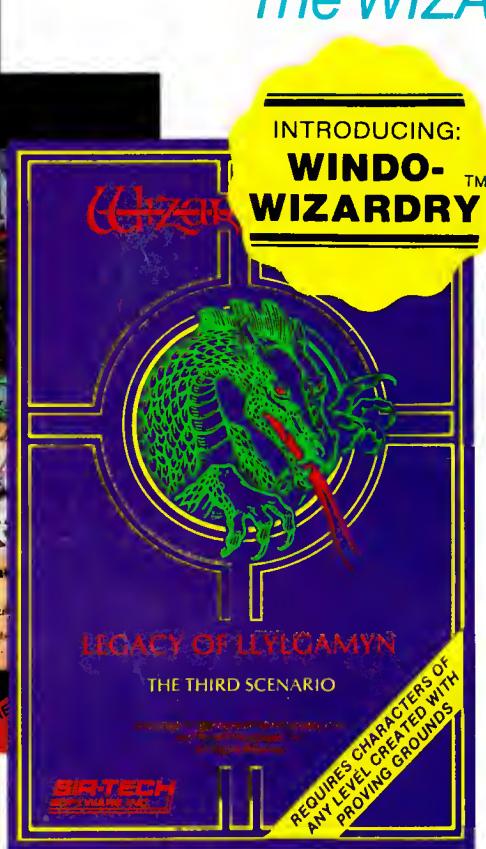
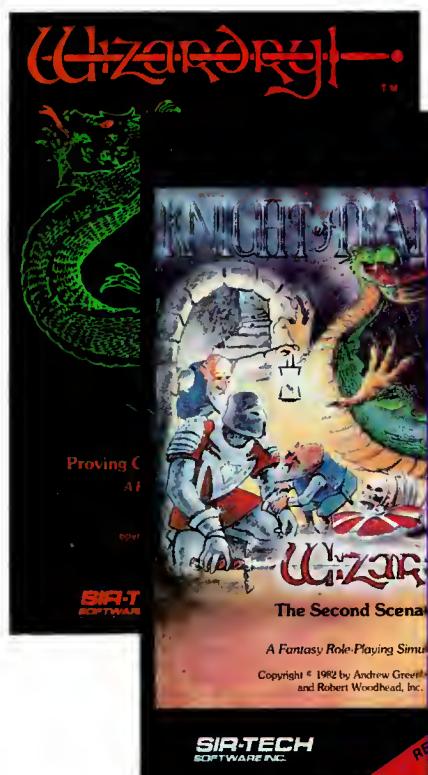
See your dealer today. Then plug into the exciting world of telecomputing.

**Hayes Microcomputer Products, Inc.**, 5923 Peachtree Industrial Blvd., Norcross, Georgia 30092. 404/441-1617.

FCC approved in U.S.A. Micromodem IIe is a registered trademark of Hayes Microcomputer Products, Inc. Smartcom I is a trademark of Hayes Microcomputer Products, Inc. Apple is a registered trademark of Apple Computer, Inc. Touch-Tone is a registered service mark of American Telephone and Telegraph. CP/M is a trademark of Digital Research, Inc. CP/M Plus is a trademark of Advanced Logic Systems. ©1983 Hayes Microcomputer Products, Inc.

# COMMITTED TO EXCELLENCE:

**OUR COMMITMENT IS YOUR GUARANTEE OF SOFTWARE THAT CHALLENGES, ENTERTAINS, AND INTRIGUES!**



*The WIZARDRY Phenomenon Continues!*

Now, better than ever, the Wizardry adventure continues with LEGACY OF LLYLGAMYN. Cast spells, work your way through a 3-D maze and enjoy the thrill of Wizardry with our newest software innovation--WINDO-WIZARDRY™. Its Lisa-like windows help you play faster and more efficiently than ever before! All the information you'll ever need is at your fingertips' command. SOFTALK's Review Editor, Roe Adams, calls LOL "...an excellent game! It's a landmark in graphics advancement." LEGACY OF LLYLGAMYN is a new world of excitement!

**"The Best Yet!"**

Margot Comstock Tommervik,  
Editor, SOFTALK

# SIR-TECH SOFTWARE INC.

# in Cider™

## ARTICLES

### Bill Budge: Pinball's All-Time High Scorer **30**

Our intrepid reporter tracks down Apple computing's matinee idol. Sorry, no autographed centerfold included.

by Sam Whitmore

### Titles Slides Without Peer **50**

You needn't worry about boring your guests with home slide shows if you include some pictures you took with your Apple.

by Dr. Kenneth A. Deitcher

### Stack Attack **54**

You've seen science fiction characters play three-dimensional chess on TV. Now you can play three-dimensional tick-tack-toe on your computer.

by Subu Magge

### Electronic Arts **35**

Bill Budge is only part of this innovative company. We talk to the genius who organizes geniuses.

by Sam Whitmore

### The World's Cheapest Word Processor **64**

If you ever thought, "Hey, someone should invent a cheap Pascal word processor," well, someone just did! And it's yours, free.

by James R. Florini

### Flashcards **38**

Can your Apple help you learn foreign languages quickly and easily? Mais oui!

by Peter A. and Jerry P. Lachenbruch

### inCider's inSidious inSolubles **82**

The Savings Accrual  
by Arthur H. Ude

### Hunting the Elusive ASCII **42**

Forget about word processing—how does the computer keep track of all the letters and other individual characters you keep typing in?

by Arsen Darnay

### The Compleat Text File Primer, Part 3 **84**

Our series continues with an examination of data's journey between the disk and the memory.

by Lee Swoboda



Flashcards, p. 38

Bill Budge: Pinball's All-Time High Scorer, p. 30



Hunting the Elusive ACSII, p. 42



## DEPARTMENTS

**Hot Cider**  
by Wayne Green

**Fermentations**

**Letters**

**III's Company**

The New Apple III—  
How Much of a Plus?

**Fudge It!**

Hundreds of Scenes Per Disk!

**Interaction—A Child's World**

Baby's First Computer Program

**The Applesoft Adviser**

The Sort Index

**Bent on Business**

Talking to Yourself

**The Apple Clinic**

Third-World Computing; Sticky Keys;  
The Vacuum Secret

**Hints 'n' Techniques**

Out, Damned Cursor!; Paddle Reading

**Calendar**

**Book Reviews**

Write Your Own Apple Games; Pascal  
Programs for Games and Graphics; The  
Naked Computer

**Hardware Reviews**

Amdisk-I Micro-floppy Disk Drive;  
KoalaPad; Inforunner Riteman Printer;  
Apple Color Plotter

**Software Reviews**

Cut & Paste; I.Q. Baseball; Cubit;  
OPVAL; Portfolio; Circascript

**Cider Vinegar**

**New Publications**

**New Software**

**New Products**

**6** *inCider* is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 45 computer publications in 18 major countries. Nine million people read one or more of the group's publications each month. Members of the publication group include: Australia: *Australasian Computerworld*, *Micro Computer Magazine*; Argentina: *Computerworld/Argentino*; Brazil: *DotoNews*, *MicroMundo*; Denmark: *Computerworld/Danmark*, *MikroData*; France: *Le Monde Informatique*; Germany: *ComputerWoche*, *Micro-ComputerWelt*, *PC Welt*; Italy: *Computerworld Italia*; Japan: *Computerworld Japan*, *PC Japan*; Mexico: *Computerworld/Mexico*; Norway: *Computerworld Norge*, *MikroData*; People's Republic of China: *China Computerworld*; Saudi Arabia: *Saudi Computerworld*; Spain: *Computerworld/Espana*, *MicroSistemas*; Sweden: *ComputerSweden*, *MikroDotorn*, *Min Hemdotar*; United Kingdom: *Computer Management*, *Computer Business Europe*; United States: *Computerworld*, *inCider*, *InfoWorld*, *Macworld*, *Micro-Market World*, *Microcomputing*, *PC World*, *80 Micro*, Jr., RUN, *IOT CoCo*.

**112** Cover photo by Rick Browne.

**116**

**118** *inCider* (ISSN #0740-0101) is published monthly by Wayne Green Publications Group, 80 Pine St., Peterborough, NH 03458. Phone: 603-924-9471. Second class postage pending at Peterborough, NH, and additional mailing offices. Subscription rates in U.S. are \$25 for one year and \$53 for three years. In Canada and Mexico, \$27.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), \$44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. In South Africa contact *inCider*, PO Box 782815, Sandton, South Africa 2146. All U.S. and Canadian subscription correspondence should be addressed to *inCider*, Subscription Department, PO Box 911, Farmingdale, NY 11737. Please include your address label with any correspondence. Postmaster: Send address changes to *inCider*, Subscription Services, PO Box 911, Farmingdale, NY 11737.

**140** Entire contents copyright 1984 by Wayne Green Publications Group.  
**142**  
**144**  
**152**

*inCider* editorial offices  
Pine Street  
Peterborough, NH 03458  
603-924-9471

SENIOR EDITOR  
Paul C. Quinn

MANAGING EDITOR  
Peg LePage

TECHNICAL EDITOR  
Robert M. Ryan

EDUCATION EDITOR  
Joan Witham

COPY EDITOR  
Melody Bedell

ASSISTANT EDITOR  
Cynthia K. Carr

EDITORIAL DESIGN MANAGER  
Susan Gross

EDITORIAL DESIGNER  
Judy Oliver

LAYOUT EDITORS  
Joan Ahern, Phil Geraci,  
Maurelle Godoy, Sue Hays,  
Phyllis Pittet, Glenn Suokko

PROOFREADERS  
Peter Bjornsen, Harold Bjornsen,  
Robin Florence

EDITORIAL DIRECTOR  
WAYNE GREEN PUBLICATIONS GROUP  
Jeff DeTray

PRODUCTION  
Nancy Salmon, Director; Lahri Bond, Cindy Boucher, Sandra Dukette, Marlene Mowbray, Lynn Simonson, Ken Sutcliffe, Leslie Walden  
Ad Coordinators: Paula Ramsey, Patricia Bradley, Jean Southworth  
Advertising Production: Bruce Hedin

FILM PRODUCTION  
Donna Hartwell, Laurie Jennison, Theresa Verville, Robert Villeneuve

PHOTOGRAPHY  
Nathaniel Haynes, Supervisor; Laurie Cardos, Carol Lake, Jean Quickmire, Sturdy Thomas

TYPESETTING  
Sara Bedell, Supervisor; Darlene Bailey, Prem Gongaju, Lynn Haines, Cynthia Letourneau, Kimberly Nadeau, Lindy Palmisano, Heidi N. Thomas

COPYWRITING  
Steve Tripp, Chief;  
Dale Tietjen

DESIGN  
Christine Destrempe, Creative Director;  
Joyce Pillarella, Design Manager;  
Holly Fuette, *inCider* Magazine Design Consultant;  
Sue Donohoe, January Folsom, Patrice Scribner,  
Sara Werninger, Administrative Assistants

**Submissions:** We're always looking for first-class manuscripts at *inCider*. We'll consider publication of any material for the Apple. Guidelines for budding authors are available—just address an envelope to yourself and include it with your request. Mail manuscripts or requests for writers' guides to: *inCider* editorial offices, 80 Pine St., Peterborough, NH 03458.



PUBLISHER/PRESIDENT Wayne Green  
VICE PRESIDENT/GENERAL MANAGER Debra Wetherbee  
VICE PRESIDENT/FINANCE Roger Murphy  
ASSISTANT TO PRESIDENT/VP Matt Smith  
ASSISTANT TO VP/FINANCE Dominique Smith  
DIRECTOR OF MARKETING AND SALES David Schissler  
CIRCULATION DIRECTOR William P. Howard  
603-924-9471  
RETAIL & NEWSSTAND SALES MANAGER Cinnie Boudrieau  
800-343-0728  
MARKETING & RESEARCH MANAGER Wendy Haines  
ADVERTISING Stephen Twombly, Director;  
Renny Weis, Manager; Paul Boule;  
Michele Gilmore, Ad Coordinator.  
PUBLIC RELATIONS Jim Leonard

*inCider* magazine is published monthly by Wayne Green Publications Group. Entire contents copyright 1984 Wayne Green Publications Group. No part of this publication may be reprinted, or reproduced by any means, without prior written permission from the publisher. All programs are published for personal use only. All rights reserved.

**Problems with Advertisers:** Send a description of the problem and your current address to *inCider*, Route 101 and Elm Street, Peterborough, NH 03458, attn. Rita Rivard, Customer Service Manager. If urgent, call 1-800-441-4403.

**Problems with Subscriptions:** Send a description of the problem and your current and/or most recent address to: *inCider*, Subscription Department, PO Box 911, Farmingdale, NY 11737.

**Change of Address:** Send an old label or a copy of your old address and new address to: *inCider*, PO Box 911, Farmingdale, NY 11737. Please give eight weeks' advance notice.

**Microfilm:** This publication is available in microform from University Microfilms International. United States address: 300 North Zeeb Road, Dept. P.R., Ann Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London, WC1R4EJ, England.

**Dealers:** Contact Ginnie Boudrieau, Bulk Sales Manager, *inCider*, Pine Street, Peterborough, NH 03458. Call 1-800-343-0728.

**Back Issues:** Send \$3.50, plus \$1.00 postage, for each copy to *inCider*, Back Issues Dept., Route 101 and Elm Street, Peterborough, NH 03458. For ten or more copies postage is a blanket \$7.50. To order by telephone using VISA, MasterCard or American Express call 1-800-258-5473 from outside New Hampshire, or 924-9471, ext. 136, within New Hampshire.

## Remarks from the Publisher... Wayne Green

**C**hain selling—no, nothing to do with bondage or K-Mart. What I have in mind would take advantage of the main Apple strength—one which no other computer system has, but which has not been really developed by Apple. I'm thinking along the line of the chain letter.

When I was a youngster, some brilliant chap somewhere in the U.S. started chain letters. I watched with awe as my father and grandfather received hundreds of envelopes, each with a dollar bill in it. And please remember that a dollar bill in the early '30's would buy about what we get with a \$20 bill today.

What Apple has is a body of over one million Apple II/IIe owners who are not just the owners of a certain brand of computer—no, it's an emotional thing—in some ways more like a religion. This is why there are so many avid Apple user groups. This is one of the big reasons why Apple sales have done so well.

*inCider* was started just over a year ago and in that short period there are over a half million Apple owners reading it every month. Just think what could happen to Apple sales if every *inCider* reader decided to make it his or her responsibility to convince one more person to buy an Apple! That could increase Apple ownership by about 50 percent in short order.

Accepting that perhaps only a third of the *inCider* readers will see this editorial, we still have a powerful group for chaining. If every Apple owner reading this were to make a goal, every two months, of convincing one friend or a business to buy one Apple computer, that alone would sell about 1.2 million Apples in the next year.

If each of these new owners were to be infused also with the Apple spirit and set about doing the same,

in one year we would have 13 million more Apples out there, a lot of frazzled Apple executives trying to keep up with the orders and thousands of blissful stockholders... for that would run to about two billion in sales just for Apple IIs.

Now how difficult would it be for you to round up a new customer for an Apple every couple of months? Our research shows that 85 percent of you have substantial influence with your business on computer purchases. Well, use your influence! Further, the research is quite clear that virtually no one buys a computer today without asking friends who already have them for advice on their choice. Yep, you have a lot of friends and business compatriots who are right now trying to decide between Apple and IBM. If you keep quiet both of us will lose, so keep asking around and get to these people before they invest a lot of time and money in something else. Point out how great your system is—all the things you are doing with it and how you'll be able to help them get started.

Later you can encourage your friends to, in turn, get their friends to go the Apple II route. If each of the six people you sell on Apple does the same every two months, you'll have a chain resulting in 63 new Apples being sold.

Of course, I am basing the whole idea on your being enthused, but not terribly energetic. If you could get that into a one-month ramp instead of two, we'd end up with 4,095 more Apple II owners in one year. So, if only one third of the Apple II users joined the chain, we would see some two billion Apple IIs sold in the next year—bringing the sales for Apple to about \$3 trillion. Hey, maybe I'd better buy a few more shares of Apple stock, eh? ■

# PRO-MODEM 1200



Circle 268 on Reader Service card.

## It's about time.

Time for your computer to make the telephone connection — with an intelligent, full 212A 300/1200 baud modem — with a real time clock/calendar — and with the capability to expand into a complete telecommunications system. It's time for PRO-MODEM 1200. Much more than just a phone modem.

When you're on-line, time is money. PRO-MODEM telecommunication systems help you save. By monitoring the duration and cost of your phone calls. And by sending and receiving messages, unattended, at preset times when the rates are lower...with or without your computer.

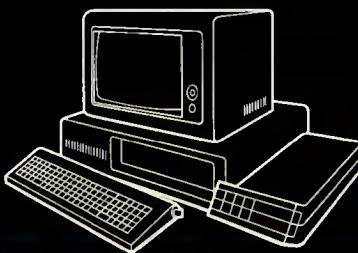
Compare the \$495 PRO-MODEM 1200 with any other modem on the market. For example, you'd have to buy both the Hayes Smartmodem 1200 plus their Chronograph for about \$950 to get a modem with time base.

PRO-MODEM 1200 is easy to use. A convenient "Help" command displays the Menu of operating command choices for quick reference whenever there's a question about what to do next. Extensive internal and remote self-diagnostics assure that the system is operating properly. Some of the other standard features include Auto Answer, Touch Tone and Pulse Dialing, and Programmable Intelligent Dialing.

PRO-MODEM does more. It lets you build a full telecommunications system with features like Auto Dialer, Incoming and Outgoing Message Buffering, Business/Personal Phone Directory, Programmable Operating Instructions, a 12-Character Alpha-Numeric Time and Message Display, and versatile PRO-COM Software. PRO-MODEM commands are Hayes compatible so you can use most existing telecommunications software without modification.

There's much more to the PRO-MODEM story. See your local dealer for complete details. He'll show you how to save time. And money.

Prometheus Products, Inc., 45277 Fremont Blvd., Fremont CA 94538, (415) 490-2370



# PROMETHEUS

by Swain Pratt

## Your Child and Your Apple— Think Again!

To judge by countless media reports, the microcomputer is fast becoming the latest educational bandwagon. Many teachers and parents are eagerly jumping aboard (to the joy of industry marketing people), and where they jump, children must perforce follow.

This was, perhaps, inevitable. Concerned and responsible educators naturally must consider seriously a new machine with such apparent potential as an educational tool. Many parents, anxiously concerned about their offspring's future, fall in line. After all, the arguments are persuasive.

The computer will help children learn facts (and won't discourage by criticism); it will help them think logically (adventure games?); it will give them confidence (success *will* come as they learn which keys to press); it will give them—the bottom line—the knowledge and skills to compete in tomorrow's computer-oriented business world.

Proponents proclaim that elementary schools—as well as high schools—should have computer programs for all. It's never too late to start, is it? And, so saying, why not for preschoolers? And even for babies? Early familiarity is bound to make children computer-friendly. So, ever-increasing in strength flows a flood of feeling that the computer is a wonderful tool to help kids learn while having fun, and the sooner the better.

I beg to differ, like the little boy in the fairy tale who cried, "But he hasn't anything on!" when the naked emperor paraded by in his fine, but imaginary, new clothes.

I don't at all question the sincerity of *most* of those who are convinced that computers are good for children.

I am just as strongly convinced, however, that computer use in any significant and continuing degree tends to be damaging to young children. By young I mean up at least until puberty, and I think the harm done is probably in inverse proportion to age.

I fully realize I'm uttering what amounts to heresy in a computer magazine, so I must have reasons. I do. I feel strongly that our technological environment and the kind of thinking that has created it are robbing our children of their childhood. Everything encourages them to grow up too fast, their education, for example, forcing them prematurely into an exercise of logical thought that may develop a sort of precocious cleverness, but ultimately results, I'm convinced, in modes of thought that are narrow, sterile, inflexible—the quality of thinking that is guiding world events today. (Are you impressed with the results?)

A child, like a new plant shoot, is a tender and sensitive being, open and vulnerable to the influences of everything in his environment. The preschool child is especially so. The impressions of the world he experiences work deeply into him, affecting his behavior and even his organic development.

Along with everything else, machines make their impressions, imprint their natures into the child in a very subtle way, and the computer is one of the machines I would most prefer that my child experience as little as possible. It is a fine tool for adults to use for many appropriate purposes (and certainly high school students should have computer courses), but in its very nature the computer embodies the principle of the conditioned response.

Here we have to be extremely

wary. Much in the world today, some of it even consciously directed, works to condition a human being to behave automatically in response to certain stimuli. These forces work to rob him of his independence, his power of individual judgment, eventually of his freedom.

The computer is one more machine that, unless it's used with consciousness and care, contributes further to a kind of automatic, programmed thinking. An adult at least has a conscious ego that, aware, can resist this influence, but the young child has no such defense.

You may not buy my argument at all, but suppose I'm right? TV was once the wonder machine. It was going to revolutionize education, some said, and it certainly became the nation's baby-sitter. Years of experience have now revealed the harm it does to children. We don't as yet have years of experience with the computer, but suppose it is equally, or perhaps more, inimical to the child's healthy development?

Isn't it at least your responsibility not to blindly welcome this machine into your child's life, but to give the matter some very careful thought? Even if the bandwagon is great fun, should you be on it? You can always step off, and if most people think you're crazy, well, that isn't the end of the world. ■

*Our good friend and colleague on Run magazine, Swain Pratt, penned this guest editorial. An educator for nearly three decades, Swain is an expert on child development. He is the first to acknowledge that his strong views on computers and kids are not universally embraced. In fact, for a cogent counterpoint to Swain's opinion, turn to page 28 and "Baby's First Computer Program," by Brian Murphy. Let us know how you stand on this volatile topic.*

—eds.

# System Saver® didn't become the Apple's number one selling\* peripheral by being just a fan.

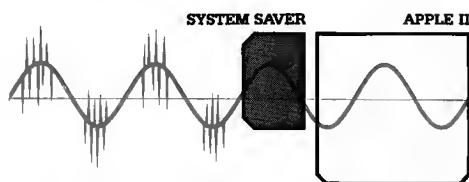
What made over 100,000 Apple® owners fall in love with System Saver? The answer is simple. It's the most versatile, most convenient, most useful peripheral ever made for the Apple.

## System Saver filters out damaging AC line noise and power surges.

70-90% of all microcomputer malfunctions can be traced to power line problems.\*<sup>\*\*</sup> Problems your System Saver guards against.

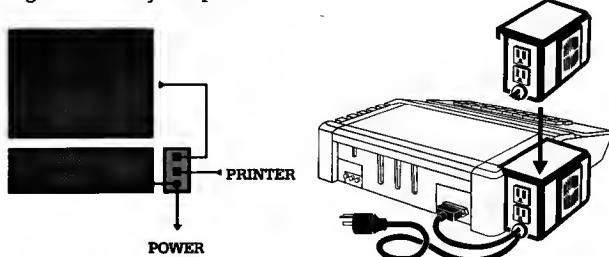
Power line noise can often be interpreted as data. This confuses your computer and produces system errors. Power surges and spikes can cause severe damage to your Apple's delicate circuitry and lead to costly servicing.

System Saver clips surges and spikes at a 130 Volts RMS/175 Volts dc level. A PI type filter attenuates common and transverse mode noise by a minimum of 30 dB from 600 kHz to 20 mHz with a maximum attenuation of 50 dB. You end up with an Apple that's more accurate, more efficient and more reliable.



## System Saver makes your Apple more convenient to use.

No more reaching around to the back of your Apple to turn it on. No more fumbling for outlets and cords to plug in your monitor and printer. System Saver organizes all your power needs.

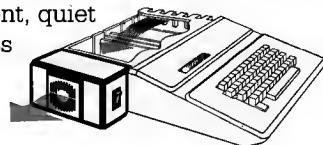


It functions as a multi-outlet power strip with two switched outlets. Plus System Saver offers the ultimate convenience; a front mounted power switch for fingertip control of your entire system.

## System Saver lets your Apple keep its cool.

Today's advanced peripheral cards generate heat. In addition, the cards block any natural air flow through the Apple IIe creating high temperature conditions that shorten the life of the Apple and peripheral cards.

System Saver's efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots. It leaves your Apple cool, calm and running at top speed.



So if you want to keep damaging heat, line noise and power surges out of your system for good, pick up the only peripheral that's in use every second your computer is in use. The System Saver. You'll soon come to think of it as the piece Apple forgot.

## Compatible with Apple stand



**\$89.95 at Apple dealers everywhere.**

 **KENSINGTON  
MICROWARE**

251 Park Avenue South, New York, NY 10010  
(212) 475-5200 Telex: 467383 KML NY

Circle 86 on Reader Service card.

\*Softsel Computer Products Hot List. \*\*PC Magazine, March 1983

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Available in 220/240 Volts, 50/60 Hz.

System Saver is a registered trademark of Kensington Microware Ltd.  
© 1983 Kensington Microware Ltd. System Saver is patent pending.

# Letters

## Blame the FAA

I was shocked to read your editorial in the January *inCider*. As I read it, I began to get angry at the injustice you were doing to Eastern Airlines. Getting mad at an airline for obeying a Federal Aviation regulation (HCFR Part 91.19) is much like arguing with a state trooper about the speed limit. Paragraph 65 of 91.19 does indeed put the burden of proof on the individual airline. If the FAA has, in fact, run careful tests and determined that no problem exists, why haven't they modified or deleted 91.19? It's a little ridiculous to expect every airline, from United to the smallest commuter, to purchase and test the ever-increasing electronic equipment available to the public.

Virtually no changes to the regulations can be done without coordinating with the Carriers' Principal Maintenance Inspector in Miami. He, in turn, would contact his superiors in Washington to see if tests had been certified. Then he would work with Eastern's engineering department to plan a schedule. Members of this department would then have to fly numerous trips with this equipment on each type of aircraft Eastern flies and submit test results which would be approved. After that, the FAA would have to approve the wording change to the Carriers' Operating Specifications and the crews would be notified. If you've had any dealings with the government, you must realize these tests have been going on since the first time a flight attendant asked someone to turn a computer off—probably over a year.

Your real foe never was Eastern Airlines. Only the FAA has been holding all of us back. I've worked as an FAA inspector and as an airline pilot; I know of few times when the airline could afford to be as slow and as cumbersome as the federal rule-making process.

In any case, Eastern has done its homework. We have always been a business airline. Our Executive Trav-

eler and Frequent Flyer programs cater to people like you and we wish to continue to do everything in our power to make Eastern a successful enterprise.

Jim Furlong  
765 Wickerberry Knoll  
Roswell, GA 30075

## Sexy Controversy

In the March 1984 issue, John R. Pleacher took umbrage at an advertisement in the December 1983 issue for alleged sexual implications. Please note that many of us manage to thoroughly enjoy sex and computing without guilt. The advertisement in question contained absolutely nothing offensive. These managers of others' morals should have their own floppies examined.

James Haskin  
4812 Rosewood Ave.  
Los Angeles, CA 90004

I agree with John R. Pleacher's letter (March 1984) expressing feelings against ads with sexual connotations. Using women as sex objects to sell merchandise has no justification. Ad writers for magazines can sell their products in ways other than that shown on page 19, March 1984—the very issue in which Pleacher's protest appeared. Wayne, start listening!

John Giese  
808 E. Huron  
Milford, MI 48042

I agree with Mr. Pleacher's desire that computing magazines be free of ads involving the erotic. If the ads were in bar code, no one would have to look at their contents unless they wanted to.

Raymond J. Schuerger  
Box 460D Steubenville Pike  
Pittsburgh, PA 15205

## Earle in Africa

Thank you for "The Apple Clinic." It is excellent. Now the first thing I turn to when I receive *inCider* is

"The Apple Clinic" (and not because Lexington is my home town).

P. R. Christensen  
Kenya Institute of Education  
Nairobi, Kenya

## Mail Order Complaints

*inCider* has received numerous letters regarding Starfire Games, a division of Omni Soft Corp., 9960 Owens Mouth Ave., Suite 32, Chatsworth, CA 91311. These complaints center on Omni Soft's apparent disinclination to ship ordered products or refund checks. We have attempted to contact Omni Soft on behalf of our readers, but to date our efforts have been unsuccessful. We're still trying.

If you're having problems with one of *inCider*'s advertisers, by all means, write to us right away. Address your complaint to Rita Rivard, *inCider*, Route 101 and Elm St., Peterborough, NH 03458. We'll do our level best to straighten the matter out.

—the editors

## Wiz Fix

It's probably my fault, but I noticed two errors in the listing you published in your February issue in my letter about Wizfix.

Line 571—[ missing after PEEK in the first line

Line 589—[ missing after PEEK  
Sorry!

Alan Popow  
#1107-9810-105 St.  
Edmonton, Alberta T5K 1A6

## inSpirations

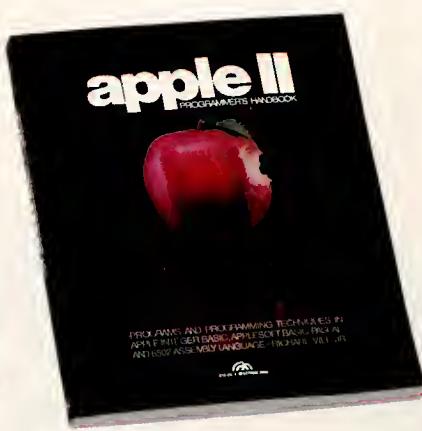
I'd like to cast my vote for getting software through your magazine. Bar code readers are an intriguing idea. What if *inCider* starts a dial-up computer and allows current programs to be down-loaded? I would be willing to pay for this, or you could make it available to your subscribers.

Robert T. Russell  
69 Dogwood Cres.  
Scarborough, Ontario M1P 3N5

# Prentice-Hall speaks a language other publishers have forgotten. **English.**



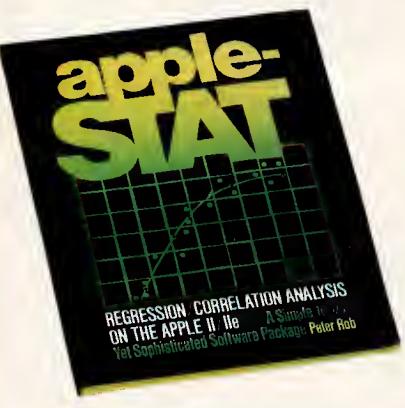
**APPLE BASIC** by Richard Haskell. A step-by-step, illustrated intro that shows how to write programs for financial management, graphics, games, math problems, and more. \$12.95



**APPLE II PROGRAMMER'S HANDBOOK** by Richard Vile, Jr. Teaches four most common Apple programming languages: Integer BASIC, Applesoft BASIC, Apple (UCSD) Pascal, and 6502 Assembly Language. Plenty of applications. For intermediate programmers. \$16.95



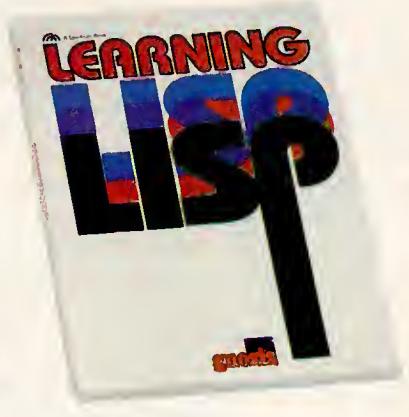
**APPLE II-6502 ASSEMBLY LANGUAGE TUTOR** by Richard Haskell. A specially designed book/disk tutorial that makes it easy to learn assembly language programming and interfacing techniques. \$34.95



**APPLESTAT:** Regression/Correlation Programs for the Apple II/Ile by Peter Rob. Easy-to-use, yet sophisticated statistical management system in book/disk package. Includes convenient HELP feature. \$49.95



**INTERFACE PROJECTS FOR THE APPLE II** by Richard C. Hallgren. Hardware-oriented projects that are easy to build, and enable users to discover Apple II's vast capabilities. \$12.95



**LEARNING LISP** by Gnosis. An intro to the much talked-about language of artificial intelligence. Packed with examples and exercises. Disk available. \$14.95

**PRENTICE-HALL/ THE LEADER IN COMPUTER PUBLISHING**

For more information about our computer books and software, write to us at the address below. Dealer inquiries welcome.  
Prentice-Hall, General Publishing Division, Englewood Cliffs, N.J. 07632

\*We guarantee that all our guides are easy to read and simple to apply without the aid of a reference library, a computer salesperson, or a niece who just graduated from M.I.T.

# ///'s Company

by Bill O'Brien

## The New Apple III— How Much of a Plus?

**B**elieve it or not, something new besides the Macintosh and the Lisa 2 walked out of Apple recently. It was the relatively unheralded Apple III Plus. The differences between it and the original Apple III are not enough to make you go out and make a trade, but for anyone who hasn't yet bought a III and is considering it, a discussion of the differences should be worthwhile.

### Facelift

The first hint that the Plus is different is the keyboard, a lighter grey than the original. And the keyboard is not only painted differently—the keys have also been arranged in a slightly different order. A delete key has been added to the upper right corner of the main keyboard, replacing the vertical rule/backslash key, which has been moved to the next row. The tilde/reverse hyphen that the vertical rule/backslash displaced has been moved to the lower left corner of the keyboard, just to the right of the caps lock key. The right-hand shift key has been elongated about one-half inch, which, of course, means that there's no longer room for the up arrow.

The up-arrow has been reassigned as the bottom-most key on the right side of the keyboard, aligning all of the arrow keys in one row. This puts an extra key in that row with no room to accommodate it. So the space bar has been shortened. Not by much, but if you usually depress the bar with your right thumb, you might

find yourself hitting the closed apple key instead. Where did that come from? The apple keys have been relocated to either side of the space bar, open to the left, closed to the right.

The numeric keypad, unfortunately, remains unchanged. The addition of +, -, \*, and / keys would have made it a real calculator style pad. What they have done is make the Apple III keyboard more compatible with the Apple IIe.

The rear of the machine has also undergone some renovation. Gone is the familiar blue connector for the external disk drives. In its place is a full-fledged RS-232-type connector. For those wanting to cross over with existing Apple III drives, an adapter is available. From the look of things, future drives will be coming with external RS-232 (or more properly, DB-25, since it's the physical type and not the signal levels we're concerned with) connectors.

To accommodate the slightly wider RS-232 connector and a slightly broader power switch, the mini-jack for the audio output has been moved to just above the RCA female plug for black and white video. This is a serious mistake. Depending on the barrel width of the plugs you're inserting there, they can now interfere with each other—bend against each other, in fact. Under the circumstances, I would give them a six-month life span of plugging and unplugging. To extend their life, you might want to leave them alone once they're plugged in.

### Time and Tithe

There are no obvious internal improvements in the III Plus apparent from the outside, but removing the cover reveals an unmistakable battery holder. It accommodates the back-up batteries for the clock. Yes, this reincarnation of the Apple III has a functional real-time clock. Although I haven't delved deeply into the matter, the type and positioning of the holder indicate that it could also be available as a kit.

On the right side of the machine, just below the metal casting, is an on/off switch. At first I thought it might be a toggle for the speaker. I made sure it was on, because I love that little noisemaker—but there was a small surprise.

I was running Business Graphics III and put a bar graph on the screen. I'm using an Amdek 300A amber monitor and the images are really sharp, though a little compact from top to bottom. When the bar chart began to fill, I had to look twice at the screen. There were no little rows of space in the fill area. It was solid, and so were the characters. This was no time to be disturbed by the speaker as I searched through the manuals, so I toggled the switch off. There were the rows of blank space! I was definitely onto something, and the

---

Address your correspondence to Bill O'Brien at his new address, PO Box 1010A, Fort Lee, NJ 07024.

manual confirmed it.

To wit, the side switch on the Apple III Plus is a video control. Normally the matrix that contains the screen image is 560-by-192. There is another image of the screen in computer memory, displaced by one-half line. With the switch on, both images are displayed by a technique known as interlacing. Together they fill the normal 5-by-8 character making it 5-by-16.

This apparently works in black and white graphics mode also, but the manual includes a warning that under some graphics conditions the additional memory used by the secondary screen image may be needed to generate the graphics. Using the interlace switch at those times may produce garbled screens. Also, keep

in mind that the interlace feature works best on monitors that have some screen persistence. This is not true of most black and white monitors.

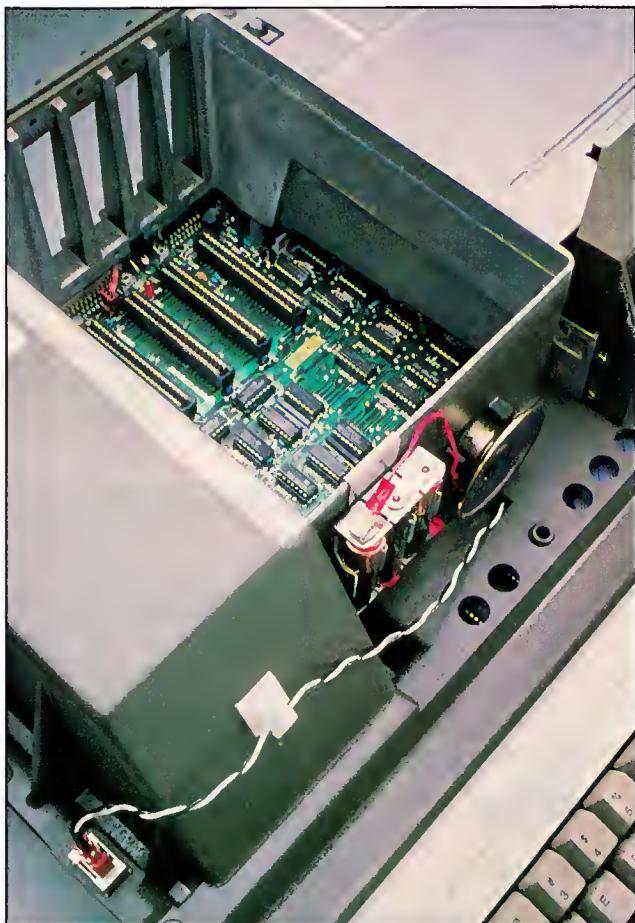
#### Little Things

On my original Apple III, there was some sensitivity to weight placed over the internal disk drive. If the 300A monitor sat squarely in the middle of the machine, the drive wouldn't boot. Apparently, mine wasn't an isolated case. With the Apple III Plus, this little inconvenience seems to have been removed.

The keyboard also appears to have a bit more tension to it. This difference may not be apparent to those of you with later Apple IIIs, for an interim machine I once tried also was better than my original III (serial

number in the low 20000s).

Your oft-used friend, SOS utilities, has been changed a little, too—in particular, the SCP. Now when you modify a driver file, you cannot change the device type and device subtype fields. That may not seem disastrous—after all, how many times have you changed the device type? That, of course, would depend on how many programs you've used that automatically check the device type to determine which drivers you have on line are controlling printers. Any such program, like III Easy Pieces, would recognize Apple's UPIC driver but not Interactive Structures' PKASO driver, because their device types are different. My suggestion would be to get an Apple III copy of SOS Utilities, just in case.



Photos courtesy of Apple Computer Inc.

Clockwise from upper left: the Apple III Plus with ProFile hard disk drive; inside the III Plus—note the batteries for the real-time clock; the keyboard upgraded for compatibility with the IIe.

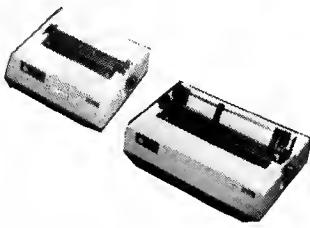
## Microline Family

The Okidata **Microline** family offers Apple II users a wide range of features for almost any application. All **Microline** printers are made with the same rugged materials and care. No matter which printer you select, you've chosen one of the best printers made.

The **Microline 92** (160 cps) is ideal for word processing. It features 10, 12 & 17 cpi, a correspondence font, double-width, emphasis/boldface, sub/super scripts, underlining, pin/friction feed (tractor is optional on the 92) & dot-addressable graphics (120 x 144 dpi). The 93 is the 136 column version. Parallel interfaces are standard; the RS-232C interface is optional.

The **Microline 84** (132 col) is the Step 2 version, featuring 200 cps at 10, 12, & 17 cpi (w/double-width), all w/ a correspondence mode & dot addressable graphics. Parallel or RS-232C interfaces available.

The **Microline 82A** (120 cps) is a data cruncher. Features 10 & 16 cpi (5/8 double-width). Dot-addressable graphics are optional. The 83A is the 136 column version. **Microline Series** . . . . . \$CALL



### Dot Matrix

ANADEX	
95008	\$1119.88
95018	\$1119.88
96208	\$1209.88
96258	\$1309.88
WP-6000	\$2359.88
WP-6000 Tractor	\$139.88

C. ITOH

### Prowriter 1 & 2 Prowriter SP



C. Itoh's **Prowriter** (120 cps) features 10, 12, & 16 cpi, a proportional correspondence quality font, double strike, double-width, sub/super scripts, dot graphics (160 x t44 dpi) & friction/tractor feed.

The **Prowriter SP** (HotDot) has faster print speed (180 cps), true sub/superscripts and italics. A new printer with nice features.

Prowriter	\$379.88
Prowriter 2	\$609.88
Prowriter SP	\$519.88
w/RS-232C	\$539.88

EPSON	
RX/FX Series	\$CALL

DS/DATA PRODUCTS	
P-480	\$439.88
Prism 132	\$1489.88
w/4-color	\$1699.88

INFORUNNER	
Riteman	\$339.88

MEMOTECH	
The DMX-80 (80 cps) features 10, 12 & 16 cpi, italics, double-width, half-width, enhanced/bold print, dot graphics (120 x 144 dpi), friction/tractor feed. Quiet printing & a sharp design make it ideal for home or office. The DMX-80 is serviced by Panasonic. DMX-80	\$339.88

MANNESMANN TALLY	
MT-160 L	\$629.88
MT-180 L	\$879.88
MT-Spirit	\$329.88

QUADRAM	
QuadJet	\$CALL

STAR MICRONICS	
Gemini 10X	\$299.88
Gemini 15X	\$429.88
Delta 10	\$499.88
Delta 15	\$589.88
Radix 10	\$629.88
Radix 15	\$739.88

### SMITH-CORONA

### Messenger



The EXP-550, but without page inject or proportional spacing.  
**EXP-550 (Parallel)** . . . . . \$609.88  
**EXP-550 Tractor** . . . . . \$129.88  
**EXP-500 (Parallel)** . . . . . \$449.88  
**EXP-500 Tractor** . . . . . \$119.88

STAR MICRONICS	
<b>PowerType</b>	

The **PowerType** (17 cps, 110 columns) has 10, 12, 15 cpi & proportional type, sub/superscripting, backspacing/underlining & Diablo 620/630 code compatibility.

**PowerType** . . . . . \$359.88

### Accessories

#### Printer Stands

Heavy-gauge steel with a baked enamel finish (beige), & a paper slot in the center for bottom feeding. Fits 80 or 132 column printers (specify).  
**80 Column Stand** . . . . . \$39.88  
**132 Column Stand** . . . . . \$49.88

#### Microfazer

Printer buffers from 8K to 512K, in parallel in/parallel out configurations. Microfazers . . . . . \$CALL

#### INTERACTIVE STRUCTURES

#### Pkaso U

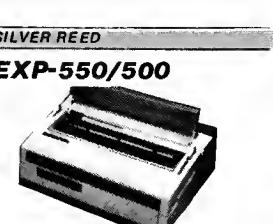
Full text & graphic screen dump (low & hi-res), 90 degree rotation, 16 gray shades, & more: that's **Pkaso**. Their new card, the **Pkaso U** is a culmination: they let you install the EEPROM from a disk with their accumulated (& extensible) knowledge of printer features. Special install menus let you customize the install. An excellent improvement.  
**Pkaso U** . . . . . \$139.88

#### ORANGE MICRO

**Grappler +** . . . . . \$139.88  
**Buffered Grappler +** . . . . . \$189.88

#### TBL PRODUCTS

**Parallel Printer Card**, includes cable . . . . . \$79.88



The EXP-550 (17 cps, 132 columns) features 10, 12, 15 cpi & proportional sub/superscript, underlining & **true** Diablo 1600 code. Friction feed, an optional tractor is also available. The EXP-500 (12 cps, 100 columns) is the same specs as

## THE MAILMAN COMETH

Those of you using Apple III's in business might want to consider an in-house mail system. They're quite common in large firms where executives are often either out of the office or too busy to collect or leave messages during business hours.

Look through your copy of *Can Someone Please Tell Me What the Apple III Can Do?*. There, on page 58, you'll find Info-net from Sun Data in Logan, Utah. To use it, you'll need a 256K system, a Hayes Smart-Modem, and a large secondary storage device—anything from a Micro-Sci A143 .5-megabyte floppy disk, through a 5-megabyte Profile, up to an Xcomp 20-megabyte unit, depending on the size of your organization and the number of messages involved.

Info-net is not simply a message center, either. It's a complete bulletin board system with password protection and levels of access, and the capability to file mail for future reference rather than hold onto it and clutter your mailbox. Now all those portables and lap computers make sense—for using your Apple III and Info-net to tie everyone together into a cohesive information network.

Sun Data's companion program, EASYTERM III, offers the same features as Access III, with an off-line mode as well. Unfortunately, it falls just short of great since there are no editing features in the off-line mode for creating data without being tied to a mainframe's editor.

## KORRECT MY SPELLING

Apple has been busy on software, too. I've just gotten my hands on a copy of Apple Speller III and it's nothing to sneeze at. It will work with *any* text file, not just one created by Apple Writer III, although it works *best* with Apple Writer III, version 2.0. While it can run in a 128K machine, its ability to correct misspelled words is very limited unless you have 256K.

Based on the *Random House Dictionary, Concise Edition*, Apple Speller III will ferret out misspelled or unknown words, then it will sim-

ply show them to you, it will guess at the words you meant, or it will search through the dictionary list for other words that come close in spelling and display them for your consideration. If it's more convenient, you can mark the words and change them later with whatever word processor you are using.

Apple Speller III's help with correct spelling is a great advantage. Most similar programs assume a misspelling occurs as a typographical error, not through ignorance; they offer no help with the true spelling. This lack of assistance has always vexed me.

### A VIDEO JACK OF THE RIGHT COLOR

It seems that some of you folk are having trouble getting good color resolution on your color video monitor. The problem, in many cases, is trying to get a color signal from the black-and-white video jack on the rear panel. The signal at that point is described, in the Apple III owner's manual, as black-and-white composite video with color information generating a linear grey scale. Getting color from such a signal is highly unlikely.

To fix the problem, procure a 75-ohm coaxial cable (type RG-59 will do), a 15-pin D connector with a suitable hood assembly, and a male RCA plug. Solder the center conductor of the coax cable to the tip of the RCA plug, and the shield braiding to its outer ring. On the other side, the center conductor should be soldered to pin 12 of the D connector, and the shield to pin 13. Once that's completed, and you're sure you've done it right, insert the RCA plug into the monitor and the D connector into the color video port on the back of the Apple III. You should get fine color now. In emulation mode, you may notice a flickering column of dots along the left side of the screen. This is, unfortunately, normal.

So we bring May to a merry close. Next month, a surprise or two, but for now, live long and program.

Ciao bene, Apple America! ■

### Monitors

NEC

#### JB-1205M

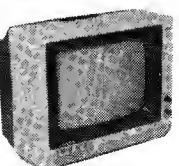


NEC's JB-1205M (amber) has an 18MHz bandwidth on 80 columns by 24 line (12" diagonal screen). The JB-1201 is the green screen version:  
JB-1205M (amber).....\$169.88  
JB-1201M (green).....\$169.88

AMDEK



300 (12" green).....\$149.88  
300A (12" amber).....\$159.88



Color II+ (Com).....\$329.88

ROLAND DG

MB-121G (12" green).....\$159.88  
MB-121A (12" amber).....\$159.88

### Modems

US ROBOTICS

#### Password

A direct connect originate/answer modem. 300/1200 baud, auto dial/answer, auto mode/speed select, full/half duplex, local echo, DTR override, RS-232C pins 2 & 3 reversible & audio, one line monitor. Includes RS-232C cable, power supply & modular carton. RS-232C interface for Apple II optional.  
Password.....\$369.88

MPI

RS-232C Card.....\$89.88

DC HAYES

#### Micromodem IIe

The Micromodem IIe is an originate/answer, auto dial/answer, full/half duplex internal modem for the Apple/Franklin systems. It includes a communications package (Smartcom II), modem board, cables & complete documentation. A superior product.  
Micromodem IIe.....\$259.88

Smartmodems

300 baud.....\$239.88  
300/1200 baud.....\$559.88

NOVATION

#### AppleCat II

The AppleCat II is a 300 baud originate/answer, auto dial/answer, full/half duplex internal modem for the Apple/Franklin systems. A 1200 baud version is also available.  
300 baud.....\$269.88  
1200 baud.....\$589.88

### Peripherals

MICROSOFT

#### Softcard System

Includes Z80 Softcard for CP/M\*, Videoterm for 80 column display, a 16K RAMcard, software & Thom Hogan's book on CP/M\*. Premium Package.....\$559.88  
If you've already got 64K RAM (Franklin or Ile), get the Z80/Softcard Combo. Same spec's, but without 16K RAMcard.  
Z80/Videoterm Combo.....\$519.88  
Z80 Softcard.....\$279.88  
16K RAMcard.....\$89.88

TITAN

#### Accelerator II

The Accelerator II's high-speed 6502 processor & 64K memory makes an Apple II run 3½ times faster. Comes with pre-boot.  
Accelerator II.....\$499.88

#### Neptune

An 80-column boards for the Apple IIe w/64, 128 or 192K RAM added. Takes the IIe short-slot.  
32K Neptune Board.....\$199.88  
64K Neptune Board.....\$319.88  
128K Neptune Board.....\$409.88  
RAMboards

32K Memory Board.....\$169.88  
64K Memory Board.....\$279.88  
128K Memory Board.....\$399.88

VIDEX

#### VideoTerm

The VideoTerm produces an 80-column display. Soft switch lets you toggle between 40 or 80 columns. Upper/lower case, CP/M® & Pascal compatible.  
VideoTerm w/switch.....\$239.88  
VideoTerm w/o switch.....\$209.88

#### UltraTerm

UltraTerm takes VideoTerm one step further; it produces 160 columns, as well as 80 columns, with upper/lower case.....\$289.88

#### Enhancer II

The Enhancer II allows programmability of keys, macro definitions for keys, upper/lower case & more. It's better than having a new keyboard.....\$109.88

#### PSIO

A parallel & RS-232 interface board for the II/II+/IIe/Franklin. "Phantom Slot" & HIRES dump highlight its many features.....\$179.88

RANA SYSTEMS

#### Elite-1

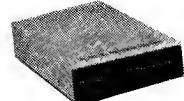
The Elite-1's are single-sided, with 163K storage, 84ms access time & 13 or 16 sectoring. The Controller Card can run four drives—Apple's Rana's or whatever—in any combination.

The Elite-2's are double-sided drives.

Elite-1.....\$259.88  
Elite-2.....\$489.88  
Elite-3.....\$639.88  
Controller.....\$99.88

ADVANCED MICRO PRODUCTS

#### Micro Drive



An Apple-compatible floppy disk drive that features a Panasonic direct-drive mechanism. There are 16 sectors per track (48 tpi), with a

total capacity of 140K bytes (half-tracking capability too).  
AMT MicroDrive.....\$219.88

### ADVANCED LOGIC SYSTEMS

#### Smarterm II

An 80-column card with inverse & highlight video, shiftkey, etc. 7x9 char, 80 col x 24 lines w/ 25th addressable line.....\$149.88

#### CP/M PLUS

The CP/M Plus card sets a new standard for Apple CP/M. 6MHz Z-80B processor, w/64K CP/M Plus 3.0 operating system, CBASIC language & GSX-80 software for programming CP/M Plus graphics.....\$329.88  
ALS Z-Card (Z-80 card w/CP/M 2.2 & utilities).....\$149.88  
ALS RS-232C Interface.....\$119.88

### TBL PRODUCTS

#### Cooling Fan

We are introducing a new product line for the Apple II system, marketed exclusively by THE BOTTOM LINE. We begin our effort with a Cooling Fan.

The TBL Cooling Fan attaches to the side of any Apple II system, drawing cool air across the boards. Two 110VAC plugs on the Cooling Fan allow you to plug in a monitor & printer as well. The power to your system is filtered by the Cooling Fan to reduce transient noise, spikes & surges which, like heat, can also ruin your system. The TBL Cooling Fan comes with a one-year warranty. Cooling Fan.....\$59.88

### TBL PRODUCTS

#### Drive Controller

Handles two Apple-compatible disk drives (A/B or C/D). Controller.....\$69.88

### Information/Orders:

**(603) 881-9855**

### Prices/Orders Only:

**(800) 343-0726**

### No Hidden Charges:

- You get FREE shipping on all orders within the 48 states.
- Most orders delivered within 10 days or less. UPS 2nd Day and Overnight available for most areas. (costs extra).
- Easy payment terms. We accept all major credit cards, certified checks, money orders, company checks or personal checks (allow 21 days for personal checks).
- We never charge extra for credit cards.
- Credit cards are not charged until order is shipped.
- We accept CODs up to ~1000 (add \$10 handling fee per order) payable with certified check or money order.
- We have a \$50 minimum order.
- Company Purchase Orders are accepted on a limited basis & upon approval only. Sorry, no APO or foreign orders accepted.

All our equipment is shipped with full manufacturer's warranty. We are an authorized dealer for all products we sell to insure full warranty support & we're authorized for warranty work on a number of printers. We also offer extended warranty plans for many printers. We prepared this ad in March & prices do change, so call to verify them.

Our Computer Showroom is now open in Amherst, New Hampshire, five miles west of Nashua (one hour from Boston).

**Send \$1.00 & computer type for our new computer catalog.**

HIGH TECHNOLOGY AT AFFORDABLE PRICES  
**THE BOTTOM LINE**



MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855

# Fudge It!

by Don Fudge

## Hundreds of Scenes Per Disk!

If you do a lot of computer art composed of colored or uncolored line drawings, or if you write adventure games, then you need utilities for displaying lots of different scenes. Educational programs coming out these days with dozens of pictures that graphically enhance the learning process are examples of applications of such utilities. This is where state-of-the-art has taken us.

There are several things you need for recreating scenes from data quickly and efficiently, especially if you have from 100 to 248 scenes stored on one side of a disk.

### Faster DOS

One requirement is some sort of fast disk operating system, such as Pronto-DOS, Diversi-DOS, Fast-DOS, TDE, or Pro-DOS, to speed up file loading from disk. Contact me for more information on this, if you don't know how to deal with it.

### Good Art

To make your creations marketable, should you so desire, a good artist is also necessary. If you're really good at designing graphics yourself, keep in mind that there are a lot

of career opportunities opening up in this field.

### Compression

The most significant need is for good drawing and screen-compressing, or data-saving, utilities. You must either draw scenes as pictures and then compress them to as few bytes as possible, or save the scenes as line data and perhaps color-fill data as well.

The advantages of compressed binary pictures are that they're easy to handle and take little in the way of memory space for decompressing



A white-on-black line drawing created with HPDRAW.



The same drawing, color-filled.

# Taxan monitors when precision counts

Dedicated to quality and precision, TAXAN offers a complete line of monitors including green and amber, ultra-high resolution monochrome, plus medium and high resolution RGB monitors.



• TAXAN also offers the 410-80, 80 column and RGB card to interface with the Apple IIe.

• TAXAN monitors stand alone.

See your local TAXAN dealer, or call us for details!

 **TAXAN**

TSK Electronics Corporation  
18005 Cortney Court  
City of Industry, CA 91748  
(213) 810-1291

Circle 402 on Reader Service card.

*Listing 1. HPDRAW.*

```

0 GOSUB 2500
1 ONERR GOTO 63990
2 GOTO 600
3 PE = PEEK (- 16336) + PEEK (- 16336): RETURN
4 PK = PEEK (- 16384): IF PK > 127 THEN POKE - 16368,0: GOSUB 2100: GOTO
6
5 RETURN
6 ROT= 64: SCALE= 1:P0 = INT ( PDL (0) * 1.095):P1 = INT ( PDL (1) * .7
5): XDRAW 1 AT P0,P1: FOR QW = 1 TO 50: NEXT : XDRAW 1 AT P0,P1
7 PK = PEEK (- 16384): IF PK > 127 THEN POKE - 16368,0: GOSUB 1900: RETURN

B GOTO 6
9 IF WI = 1 THEN V = V + 1: POKE V, PEEK (225)
10 RETURN
30 HOME : VTAB 2: PRINT "DO YOU WANT TO DRAW 256-WIDE HPLOT SHAPES O
R 280-WIDE HPLOT SHAPES WHICH REQUIRE 16-BIT (2 BYTE) X COORDINATE
& TAKE UP MORE SPACE?": PRINT
31 PRINT "(A) 256": PRINT : PRINT "(B) 280": PRINT : PRINT "(A/B)":; GET
AS: PRINT AS: IF LEN (AS) = 0 THEN 30
32 IF ASC (AS) < > 65 AND ASC (AS) < > 66 THEN 30
33 IF ASC (AS) = 66 THEN WI = 1
40 CALL 62450
47 POKE - 16303,0: HOME : VTAB 1: PRINT "USE THE PADDLE S
TO MOVE THE DOT UNTIL YOU'RE AT YOUR STARTING POINT. HIT THE BUT
TON ON PADDLE #0. NOW MOVE THE DOT UNTIL A LINE DRAWN BETWEEN THIS
DOT & THE 1ST DOT WOULD BE THE LINE
48 PRINT "YOU DESIRE, HIT BUTTON #0 AGAIN. KEEP UP THIS PROCESS UNTIL DONE
. AFTER THE LAST LINE HAS BEEN DRAWN, HIT NOT ONLY PADDLEBUTTON #0 BU
T BUTTON #1 AS WELL.": GOSUB 63000
49 GOSUB 18B: POKE - 16304,0: POKE - 16297,0
50 HOME : P1 = .75 * PDL (1): IF P1 > 159 THEN VTAB 23: PRINT "MOVE PDL
#1 COUNTERCLOCKWISE!": GOSUB 62000: GOTO 50
51 ROT= 64: HCOLOR= H: SCALE= 1:FL = 0:V = 3329:VV = 0:V1 = 3329
55 P0 = INT ( PDL (0) + (.095 * PDL (0) * WI)):P1 = .75 * PDL (1): XDRAW
1 AT P0,P1:X8 = P0:Y8 = P1
60 REM
61 PK = PEEK (- 16384): IF PK > 127 THEN POKE - 1636B,0: IF PK = 160 THEN
V = V - (2 + WI): HCOLOR= 0: GOSUB 950: HPLOT Z0,Z1 TO Z2,Z3: HCOLOR=
H: GOSUB 62000:X8 = Z0:Y8 = Z1:Z0 = Z2:Z1 = Z3: GOTO 970
62 IF PK = 193 THEN PK = 0: CALL 62450: GOTO 50
63 IF PK = 198 THEN PK = 0:FS = NOT FS
64 IF FS = 1 THEN POKE - 16302,0
65 HOME : VTAB 21: PRINT "X: " INT (P0)" Y: " INT (P1)" LINES:"VV
66 IF FS = 0 THEN POKE - 16301,0
67 PRINT "PRESENT BYTE ADDRESS:"V
68 PRINT "SCENE'S BYTE LENGTH:"V = 3328
70 P1 = .75 * PDL (1): FOR OW = 1 TO 16: NEXT :P0 = INT ( PDL (0) + (.09
5 * PDL (0) * WI)): XDRAW 1 AT X8,Y8: XDRAW 1 AT P0,P1:X8 = P0:Y8 =
P1
75 VTAB 1
80 B0 = PEEK (- 16287): IF B0 > 127 THEN PRINT CHR$ (7):V = V + 1: POKE
V, PEEK (224): GOSUB 9:V = V + 1: POKE V, PEEK (226): IF FL = 0 THEN
FL = 1:B0 = 0:Z1 = P1:Z0 = P0: XDRAW 1 AT P0,P1: GOTO 85
82 IF B0 > 127 THEN HPLOT X8,Y8 TO Z0,Z1:B0 = 0:Z3 = Z1:Z2 = Z0:Z1 = Y8:
Z0 = X8: IF ER = 1 THEN ER = 0: GOSUB 960
85 B1 = PEEK (- 162B6): IF B1 > 127 AND FL = 1 THEN HCOLOR= H: GOTO 110
90 GOTO 60
110 PRINT ":"GG = INT ((V - V1) / (2 + WI)): POKE V1,GG
120 HOME : TEXT : VTAB 2: INVERSE : PRINT "CHOOSE TO.": NORMAL : PRINT : PRINT
"(1) DRAW ANOTHER LINE IN THIS SCENE": PRINT "(2) QUIT PRESENT SCENE,
START A NEW ONE": PRINT "(3) QUIT AND SAVE SCENE": PRINT "(4) QUIT"
130 PRINT : PRINT "(1-4)":; GET AS:AZ = VAL (AS): IF LEN (AS) = 0 THEN
130
135 PRINT CHR$ (13): CALL 1002
140 IF AZ > 4 OR AZ < 1 THEN 130
150 ON AZ GOTO 160,165,170,175
160 VV = VV + 1:V1 = V + 1:V = V + 1
161 P1 = .75 * PDL (1):FL = 0
162 POKE - 16304,0: POKE - 16297,0: GOTO 55
165 CALL 62450: GOTO 30
170 POKE 3328,VV + 1: GOTO 204
175 GOTO 600
188 PRINT : PRINT "TO ERASE LINE, HIT SPACE BAR.": PRINT "TO ERASE SHAPE,
HIT A.": PRINT "TO TOGGLE MIXED/FULL SCREEN, HIT F": PRINT "KEEP # O
F LINES IN SCENE UNDER 256": GOSUB 63010
190 RETURN
204 HOME : VTAB 1
300 DS = CHR$ (4)
301 VTAB 21
302 INPUT "FILE NAME.":NS: IF LEN (NS) = 0 THEN 302
303 INPUT "DID YOU GET IT RIGHT? (Y/N)":Z$: IF LEN (Z$) = 0 THEN 302
304 IF ASC (Z$) < > B9 THEN 302
307 TEXT : VTAB 1: HOME
308 LL = (V + 1) - 3328
309 GOSUB 20000
310 PRINT DS;"BSAVE",NS;,"A3328,L":LL
311 VTAB 21: PRINT NS
312 PRINT "A3328 L"LL" LINES:"VV + 1: PRINT "(HIT ANY KEY)":; GOSUB
63010
314 GOSUB 21000
400 GOTO 600
402 HOME : VTAB 1: INPUT "FILE NAME.":STNS: IF LEN (STNS) = 0 THEN 600
403 PRINT : PRINT "DID YOU GET IT RIGHT? (Y/N)":; GET QWS: IF LEN (OWS)
= 0 THEN 402
404 PRINT QWS: PRINT CHR$ (13): CALL 1002: IF ASC (OWS) < > 89 THEN 40
2
405 GOSUB 20000:DS = CHR$ (4): PRINT DS;"LICAN";STNS: PRINT "ADDRESS.": FREE
(43634) + PEEK (43635) * 256:LG = PEEK (43616) + PEEK (43617) * 25
6: PRINT "LENGTH.":LG

```

*Listing continued.*

routines. However, the actual compressed data often occupies from 12 to 25 disk sectors—not very “compressed” for many purposes! (There may be a few of you who don’t yet know that a normal BSAVED picture is 33 sectors long and is saved with BSAVE pic, A\$2000, L\$1FF8 for page one graphics and BSAVE pic, A\$4000, L\$1FF8 for page two.)

So, compressing from 33 sectors to 12 to 25 is okay for some purposes, but very inadequate for others. If two-to-five sector colored or uncolored scenes are what you need, then put your fast DOS in place, get your scene utilities out and start truckin’!

### Back-Issue Goodies

But what if you have no scene utilities? Then you can use the ones in this column, combined with those in my August, 1983 column. In August I presented PALETTE, a scene color-filling program, PATRN-MAKER, a color palette maker, and FILL4, a machine language color-fill algorithm that fills any color you want into white line drawings on black backgrounds. (Contact me if you’d like information on how to get black-lined, white-background color-fill utilities.) If you don’t have the August, 1983 *inCider*, refer to page 6 in this issue for instructions on how to get one.

### The Programs

To supplement August’s column, you need these programs: HPDRAW, FILTABLE, A2, A3, CTABLE MAKER, SCENE RE-CREATE, A5, a HELLO program, MENU, and some changes in the PALETTE program from August. You’ll find them all in this column.

HPDRAW (Listing 1) creates either 256- or 280-pixel-wide line drawings and saves them as binary data files of two or three sectors. The advantage of 256-wide drawings is that they take up one third less memory and operate a bit faster, but at the expense of 9 percent of your

*Write to Don Fudge at Avant-Garde Creations, PO Box 30160, Eugene, OR 97403.*

# It dials and files. Finds and reminds. Sorts and reports.

## It's Micro Diary. The new way to increase your telephone productivity.

If you use the phone for business or pleasure, we can save you a lot of time. Just connect the telephone Micro Diary to your phone and computer, and you're in business with the smartest system going.

A powerful, electronic telephone directory stores 2,000 names, numbers and addresses. It finds the phone number you need and dials it automatically—including those toilsome, long-distance access codes. And with a special note-filing feature, you can put extra information with each directory listing, including contact names and key information.

The telephone Micro Diary is also strong on follow-up, maintaining your daily calendar of activi-



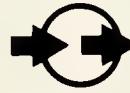
ties, plus a tickler file to call your attention to important matters. And there are many more features. A mystery phone number finder to help reconcile monthly phone bills. Sorts by phone numbers or by names. Printing too—your entire directory, calendar, notes, even mailing labels. The telephone Micro Diary is easy to install and use on practically any phone and most popular microcomputers.

See your dealer for details or contact: Wesper Microsystems:  
14321 New Myford Road, Tustin, CA 92680,  
(714) 730-6250. Telex 4720629.

*Sales and Marketing by The MARKETING RESOURCE GROUP*



Circle 529 on Reader Service card.

 **WESPER**  
**MICROSYSTEMS™**  
A WESPERCORP COMPANY

# Fudge It!

*Listing continued.*

```

406 WI = 1
408 GOSUB 21000
410 PRINT : PRINT "# OF LINES IN SCENE: " PEEK (332B)
415 POKE 250,0: POKE 251,13
420 PRINT : PRINT "SCENE WIDTH:" : PRINT : PRINT "(A) 256": PRINT "(B) 280"
"; PRINT : PRINT "(A/B) :: GET A$: IF LEN (A$) = 0 THEN 420
421 PRINT A$: PRINT CHR$(13): CALL 1002
425 IF ASC (A$) < > 65 AND ASC (A$) < > 66 THEN 420
430 IF ASC (A$) = 65 THEN PRINT DS"BLOADA2":WI = 0: GOTO 4B0
440 PRINT DS"BLOADA3"
480 HGR : POKE - 16302,0
490 HCOLOR= BC: HPLOT 0,0: CALL 62454: HCOLOR= H
500 CALL 848
510 BS = 1: VS = 0
525 GET A$: PRINT CHR$(13): CALL 1002: HOME : TEXT
530 VTAB 21: INPUT "DO YOU WANT ANOTHER FILE? (Y/N)": QWS: IF LEN (QWS) =
0 THEN 530
540 IF ASC (QWS) < > B9 THEN HOME : GOTO 550
545 GOTO 402
550 REM
600 POKE - 16303,0: POKE - 1629B,0: HOME : VTAB 1: INVERSE : HTAB 18: PRINT
"MENU": NORMAL
601 SG = 0: FL = 0: ZQ = 0: DS = CHR$(4)
602 SCALE= S: HCOLOR= H: ROT= R
603 PRINT "(HIT ESC TO QUIT OR 'M' FOR MENU)": PRINT
605 PRINT "(0)ABORT SCREEN---START OVER": PRINT
620 PRINT "(1)CHOOSE A LINE COLOR": PRINT
636 PRINT "(2)CHOOSE A BACKGROUND COLOR (USE BLACK FOR DRAWING)": PRINT
640 PRINT "(3)LOAD IN A SCENE": PRINT
650 PRINT "(4)DRAW SCENE & SAVE IT": PRINT
660 PRINT "(5)VIEW SCREEN": PRINT
670 PRINT "(6)EDIT A SAVED LINE DRAWING": PRINT
690 FLASH : PRINT "(CHOOSE 0-6)": ;: NORMAL : GET A$: PRINT CHR$(13)
691 IF ASC (A$) = 77 THEN PRINT CHR$(4); "RUNMENU"
692 IF ASC (A$) = 27 THEN TEXT : HOME : END
700 IF LEN (A$) = 0 THEN 690
710 IF VAL (A$) < 0 OR VAL (A$) > 6 THEN 690
719 IF A$ = "0" THEN 912
720 ON VAL (A$) GOTO 900,916,402,30,920,1000
721 GOTO 600
900 HOME : VTAB 1: INPUT "LINE COLOR? (0-7)": H: IF H > 7 OR H < 0 THEN 9
00
902 GOTO 600
912 INPUT "SURE YOU WANT TO ABORT SCREEN? (Y/N)": QWS: IF LEN (QWS) = 0 THEN
912
913 IF ASC (QWS) < > 89 THEN 600
914 HGR : GOTO 600
916 INPUT "SURE YOU WANT TO DO A BACKGROUND COLOR? THIS WILL ERASE ANY SH
APE1 (Y/N)": QWS: IF LEN (QWS) = 0 THEN 916
917 IF ASC (QWS) > B9 THEN 600
918 HOME : VTAB 1: INPUT "BACKGROUND COLOR (THIS ERASES SHAPES!) (1-7)": ;
BC: IF BC > 7 OR BC < 0 THEN 918
919 POKE - 16304,0: POKE - 16297,0: HCOLOR= BC: HPLOT 0,0: CALL 62454: VTAB
21: GOSUB 63000: GOTO 600
920 POKE - 16304,0: POKE - 16297,0: VTAB 21: GOSUB 63000: GOTO 600
950 E0 = Z0: E1 = Z1: ER = 1: RETURN
960 HCOLOR= 0: FOR Q = E1 - 1 * (E1 - 1 > = 0) TO E1 + 1 * (E1 + 1 < 192
): FOR W = E0 - 1 * (E0 - 1 > = 0) TO E0 + 1 * (E0 + 1 < 192): HPLOT
W,Q: NEXT : NEXT : HCOLOR= H: RETURN
970 HCOLOR= 0: HPLOT Z0,Z1 TO Z2,Z3: HCOLOR= H: GOTO 60
1000 POKE - 16304,0: POKE - 16297,0: LI = PEEK (332B): AD = 3329: FOR L =
1 TO LI
1020 SEGS = PEEK (AD) - 1: FOR S = 1 TO SEGS
1025 HCOLOR= 0
1030 HL = PEEK (AD + 1): HH = PEEK (AD + 2): V = PEEK (AD + 3): IF WI = 0
THEN V = HH: HH = 0
1035 LO = PEEK (AD + 3 + WI): HI = PEEK (AD + 4 + WI): VE = PEEK (AD + 4 +
WI + WI): IF WI = 0 THEN HI = 0
1040 HPLOT HL + HH * 256, V TO LO + HI * 256, VE: GOSUB 3: FOR QW = 1 TO PDL
(0) * 8: NEXT : GOSUB 4: HCOLOR= 3: HPLOT HL + HH * 256, V TO LO + HI *
256, VE
1045 AD = AD + 2 + WI
1050 NEXT : AD = AD + 3 + WI: NEXT : GOTO 1000
1060 IF PK > 283 THEN HI = INT (P0 / 256) * WI: LO = P0 - (256 * HI): VE =
P1: POKE AD + (4 - (WI = 0)), LO: POKE AD + (5 - (WI = 0)), HI: POKE AD
+ (6 - (2 * (WI = 0))), VE: HCOLOR= 3: RETURN
1070 HH = INT (P0 / 256) * WI: HL = P0 - (256 * HH): V = P1: POKE AD + 1, HL
: POKE AD + 2, HH: POKE AD + (3 - (WI = 0)), V: HCOLOR= 3: RETURN
2000 POKE 250,0: POKE 251,13: PRINT CHR$(4)"BLOADA3": HGR : HCOLOR= 3: POKE
- 16302,0: IF WI = 0 THEN PRINT CHR$(4)"BLOADA2"
2005 CALL 848: GET A$: PRINT CHR$(13): CALL 1002
2010 TEXT : HOME : INPUT "DO YOU WANT TO SAVE IT THIS NEW WAY? (Y/N): ";
ANS: IF LEN (ANS) = 0 THEN 2010
2020 IF ASC (ANS) < > 89 THEN CALL 54915: GOTO 2000
2050 TEXT : HOME : INPUT "FILE NAME: "; F$: IF LEN (F$) = 0 THEN 2050
2055 GOSUB 20000
2060 PRINT CHR$(4)"BSAVE" F$, A3328, L"LG: CALL 54915: GOSUB 21000: GOTO
600
2100 IF PK = 155 THEN CALL 54915: GOTO 2000
2110 RETURN
2500 POKE 2296,1: POKE 2297,0: POKE 2298,4: POKE 2299,0: POKE 2300,4: POKE
2301,0
2505 POKE 232,248: POKE 233,8
2510 HCOLOR= 3: H = 3: POKE - 16301,0
2515 HGR
2520 RETURN
20000 TEXT : HOME : FLASH : PRINT "SWITCH TO DATA DISK.": NORMAL : GOSUB
63000: RETURN
21000 FLASH : PRINT "SWITCH TO PROGRAM DISK.": NORMAL : GOSUB 63000: RETURN

```

*Listing continued.*

screen width. (X coordinates need only 8-bit numbers, as opposed to the 16-bit numbers required of 280-wide drawings.)

**FILLTABLE** (Listing 2) runs the machine language line-drawing algorithm (A2 or A3) and then uses color-fill data (to be saved during use of the PALETTE program) to color-fill the line drawing just recreated. A2 (Listing 3) recreates 256-wide line drawings, and A3 (Listing 4) recreates 280-wide line drawings.

With **CTABLE MAKER** (Listing 5) you choose 32 4-by-2 (pixel format is 4 bytes wide and 2 lines high) colors for filling scenes. Each disk of scenes has its own CTABLE (color table)—these scenes can choose from only the 32 colors in that disk's "crayon box."

**SCENE RECREATE** (Listing 6) reconstructs your data files into scenes.

Finally, A5 (Listing 7) uses the CTABLE's data to make a color palette from which you choose when color-filling.

Here's a good HELLO program with which to initialize your disk:

```

20 POKE104,96:POKE24576,0
:PRINT CHR$(4)"RUN MENU"

```

Save this as HELLO if the disk is initialized, or do INIT HELLO if it's blank.

You also need a MENU program, included in this month's listings as well (Listing 8). I made it really simple; feel free to make it a bit fancier.

Here are the BSAVE parameters for the listings needing them:

```

FILLTABLE, A7936, L210
A2, A848, L87
A3, A848, L104
A5, A37888, L256

```

Remember CALL - 151 to access the monitor for typing. Don't enter over six lines of hex code at once, and use space between codes. Do 800.8B7 types of monitor memory dumps to check your work and perhaps 800L (for example) disassembly listings to double-check.

Make sure (even if you don't use my HELLO program) that POKE 104,96:POKE24576,0 is in effect before you run MENU or the other pro-

# SEIZE CONTROL.

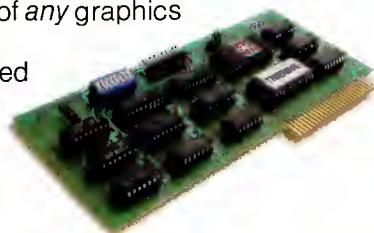
## Add a Print Screen Key to your Apple.

**FingerPrint™ is the parallel printer interface card that puts Apple in the palm of your hand. But that's only the beginning.** A touch of the FingerPrint button puts any program on hold, so you can make hard copies of any graphics or text. And do things Apple never imagined.

FingerPrint consists of the printer interface card connected to a touch-sensitive button that adheres to your keyboard.

It also comes with a free printer cable and a disk loaded with programs. Now with VisiCalc enhancements.

**We made FingerPrint smart. You can make it even smarter.** The built-in ROM provides functions like Print Screen, Program Pause, Graphic Dump, Jump to Keyboard or Monitor for De-bugging and more. With 2K of user RAM, you can invent new functions such as Keyword Search and Replace or special tasks only you could dream up.



**FingerPrint works with any parallel printer made.** And it can be programmed to interface with new printers as they come on the market.

**Get the most out of your Apple II, Apple II+ or Apple Ile.** Order FingerPrint today. Or visit your nearest dealer for a test flight.

**Thirdware has a whole family of innovative computer products.** Including a multiple-printer parallel interface, slim-line disk drives, diskettes, disk cases and the only protective sleeves that remain in place while the disk is in use. Write for our latest catalog.

Circle 32 on Reader Service card.

### ORDER TOLL-FREE.

**1-800-528-6050**

Ext. 2112

In Arizona:

**1-800-352-0458**

**THIRDWARE**  
COMPUTER PRODUCTS 

Apple VisiCalc, FingerPrint and Thirdware Computer Products are registered trademarks, respectively, of Apple Computer, Inc., VisiCorp & Precision Software, Inc.

Please send a free Thirdware catalog and complete information on FingerPrint.

Please send \_\_\_\_\_ FingerPrint(s) @ \$149 each. (Add \$3.50 shipping & handling for each one ordered.) FL residents add 5% sales tax.

Enclose check or credit card authorization for full amount.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Charge to: MasterCard/Visa (Circle one)

Acct. No. \_\_\_\_\_ Expires \_\_\_\_\_

Signature \_\_\_\_\_

Mail to: Precision Software, Inc.  
4747 NW 72nd Avenue Miami, FL 33166

# Fudge It!

*Listing continued.*

```

62000 FOR QW = 1 TO 15:PL = PEEK (- 16336): NEXT : RETURN
63000 PRINT "                                     (HIT ANY KEY TO CONT
    INUE):
63010 PK = PEEK (- 16384): IF PK > 127 THEN POKE - 16368,0: RETURN
63020 GOTO 63010
63990 PRINT CHR$ (7): POKE 216,0: ONERR GOTO 63990
63991 PP = PEEK (222): IF PP = 254 THEN RESUME
63994 POKE - 16363,0: POKE - 16298,0
63995 PRINT "YOUR ERROR IS CODE #:"PP: GOSUB 63000: CALL 54915: GOTO 600

```

grams. Using my HELLO will ensure this.

Also be sure that PALETTE and FILL4 (A\$9000,L\$400) are loaded onto

```

1F00- 20 E2 F3 A9 0D 85 FB A9
1F08- 00 85 FA 8D 52 C0 A9 7F
1F10- 85 E4 A5 F0 F0 0E A2 00
1F18- 8A A8 20 57 F4 20 F6 F3
1F20- A9 00 85 E4 20 50 03 A5
1F28- FA 85 78 A5 F8 85 7C E6
1F30- 7B D0 02 E6 7C A0 00 81
1F38- 7B 85 7D A9 01 85 7E A9
1F40- 00 A8 85 D8 E6 7B D0 02
1F48- E6 7C B1 7B 85 DA A5 E7
1F50- F0 0C E6 7B D0 02 E6 7C
1F58- B1 7B F0 02 E6 DB E6 7B
1F60- D0 02 E6 7C B1 7B 85 F9
1F68- E6 7B D0 02 E6 7C B1 7B
1F70- A8 89 00 0C 85 06 C8 B9
1F78- 00 0C B5 07 C8 B9 00 0C
1F80- 88 08 C8 89 00 0C 85 09
1F88- C8 B9 00 0C 85 DC C8 89
1F90- 00 0C 85 DD C8 B9 00 0C
1F98- 85 DE C8 89 00 0C 85 DF
1FA0- C8 A5 F0 P0 06 A7 F7 85
1FAB- E4 D0 04 A9 00 85 E4 A6
1F80- DA A4 DB A5 F9 20 11 F4
1FB8- A5 E5 85 FF 85 EF A5 30
1FC0- 85 ED 20 00 90 A5 7E C5
1FC8- 7D B0 05 E6 7E 4C 3F 1F
1FD0- 60 00 00

```

*Listing 2. FILLTABLE.*

```

0350- A2 00 A1 FA 85 E8 E6 FA
0358- D0 02 E6 FB A2 00 A1 FA
0360- 85 06 E6 FA D0 02 E6 FB
0368- A1 FA 85 08 A0 00 E6 FA
0370- D0 02 E6 FB A1 FA A6 08
0378- 20 57 F4 C6 06 20 8C 03
0380- 20 3A F5 C6 06 D0 F6 C6
0388- EB D0 C8 60 A2 00 E6 FA
0390- D0 02 E6 FB A1 FA 85 09
0398- E6 FA D0 02 E6 FB A1 FA
03A0- A8 A2 00 A5 09 60 00 00

```

*Listing 3. A2.*

```

0350- A2 00 A1 FA 85 EB E6 FA
0358- D0 02 E6 FB A2 00 A1 FA
0360- 85 06 E6 FA D0 02 E6 FB
0368- A1 FA 85 08 A0 00 E6 FA D0
0370- E6 FB A1 FA A8 E6 FA D0
0378- 02 E6 FB A1 FA A6 08 20
0380- 57 F4 C6 06 20 93 03 20
0388- 3A F5 C6 06 D0 F6 C6 EB
0390- D0 C4 60 A2 00 E6 FA D0
0398- 02 E6 FB A1 FA 85 09 E6
03A0- FA D0 02 E6 FB A1 FA 85
03A8- 08 E6 FA D0 02 E6 FB A1
03B0- FA A8 A6 08 A5 09 60 00

```

*Listing 4. A3.*

this disk and saved (and make the specified changes in PALETTE), and that the PATRN binary picture (A\$2000,L\$2000), which is BLOADED at \$4000 in PALETTE, is also saved onto the disk. These are all from August's column. Incidentally, the PATRN picture results from running the PATRNMAKER file from August.

## Scene Creation— Black and White

To create a black-and-white line drawing, choose HPDRAW from the MENU, then (4) DRAW SCENE & SAVE IT in HPDRAW. Normally specify (B) 280 for screen width, when prompted, then read the instructions. Hit F to toggle (switch back and forth) between full- and mixed-screen graphics. I strongly recommend the following rules of operation:

```

0 CLEAR : HOME : TEXT : VTAB 9: HIMEM: 36864
1 ONERR GOTO 63990
2 D$ = CHR$ (4): GOSUB 300
3 K = 3072
5 GOSUB 1900
10 POKE 230,64
B9 HOME : TEXT
90 PRINT : INVERSE : VTAB 1: PRINT "COLOR TABLE FILLER WILL PUT 32 DIFFER
ENTCOLORS INTO $C00-$CFF (3072TO3327). WHEN32 ARE LOADED, IT WILL BE
SAVED AS      CTABLE,A$C00,LS100. TO RESTART HIT ESC.: NORMAL
91 PRINT : PRINT "TO SELECT A COLOR, HIT PDL #0 BUTTON. CHOSEN COLORS W
ILL BE MARKED.": PRINT : PRINT "HIT ANY KEY.": GET AA$: PRINT CHR$ (
13): CALL 1002
92 POKE - 16304,0: POKE - 16297,0: POKE - 16299,0
99 POKE - 16302,0
200 P0 = 1.09 * PDL (0):P1 = .75 * PDL (1): IF P0 + 18 < 280 THEN XDRAW
1 AT P0,P1: XDRAW 1 AT P0 + 18,P1: FOR QW = 1 TO 100: NEXT : XDRAW 1 AT
P0 + 18,P1: XDRAW 1 AT P0,P1:O = PEEK (- 16336)
201 IF P0 + 18 > 279 THEN GOSUB 62090: GOTO 200
204 PK = PEEK (- 16384): IF PK > 127 THEN POKE - 16368,0: IF PK = 155 THEN
    CLEAR :K = 3072:D$ = CHR$ (4): GOTO 89
210 PP = PEEK (- 16287): IF PP > 127 THEN P = PEEK (229): IF P / 2 < >
    INT (P / 2) AND P > 0 THEN P = P - 1
215 IF PP < 128 THEN 200
220 A = PEEK (P + PEEK (38) + PEEK (39) * 256):B = PEEK (P + 1 + PEEK
    (38) + PEEK (39) * 256)
225 C = PEEK (P + 2 + PEEK (38) + PEEK (39) * 256):D = PEEK (P + 3 + PEEK
    (38) + PEEK (39) * 256)
230 XDRAW 1 AT P0,P1 + 1: XDRAW 1 AT P0,P1 + 1:E = PEEK (P + PEEK (38) +
    PEEK (39) * 256):F = PEEK (P + 1 + PEEK (38) + PEEK (39) * 256)
231 POKE K,A: POKE K + 1,B: POKE K + 2,C: POKE K + 3,D
232 G = PEEK (P + 2 + PEEK (38) + PEEK (39) * 256):H = PEEK (P + 3 + PEEK
    (38) + PEEK (39) * 256)
235 POKE K + 4,E: POKE K + 5,F: POKE K + 6,G: POKE K + 7,H
266 HCOLOR= 0: DRAW 1 AT P0,P1: DRAW 1 AT P0 + 4,P1: DRAW 1 AT P0 + 2,P1:
    DRAW 1 AT P0 + 2,P1 + 2: DRAW 1 AT P0 + 2,P1 - 2
268 HCOLOR= 3: DRAW 1 AT P0 + 7,P1: DRAW 1 AT P0 + 11,P1: DRAW 1 AT P0 +
    9,P1: DRAW 1 AT P0 + 9,P1 + 2: DRAW 1 AT P0 + 9,P1 - 2
270 K = K + 8
271 GOSUB 60000
272 IF K > 3327 THEN GOSUB 20000: PRINT D$"BSAVECTABLE,ASC00,LS100": HOME
    : TEXT : FLASH : PRINT "CTABLE SAVED.": NORMAL : GOSUB 21000: PRINT D
    $"RUNMENU"
280 CALL 54915:ZA = FRE (0): GOTO 200
300 PRINT CHR$ (4)"BLOADPATRN,AS4000": RETURN
1900 POKE 232,192: POKE 233,3: POKE 960,1: POKE 961,0: POKE 962,4: POKE 9
    63,0: POKE 964,60: POKE 965,54: POKE 966,0: ROT= 0: SCALE= 1: RETURN
20000 TEXT : HOME : FLASH : PRINT "SWITCH TO DATA DISK.": NORMAL : GOSUB
    63000: RETURN
21000 PRINT : FLASH : PRINT "SWITCH TO PROGRAM DISK.": NORMAL : GOSUB 630
    00: RETURN
60000 FOR QW = 1 TO 10:PM = PEEK (- 16336): NEXT : RETURN
62090 GOSUB 60000: RETURN
63000 PRINT : PRINT "(HIT ANY KEY TO CONTINUE)": PRINT
63030 PK = PEEK (- 16384): IF PK > 127 THEN POKE - 16368,0: RETURN
63050 GOTO 63030
63990 POKE 216,0:KP = PEEK (222)
63991 ONERR GOTO 63990
63995 IF KP = 254 THEN RESUME
63997 PRINT "",",",""
63998 CALL 54915
63999 GOTO 89

```

*Listing 5. CTABLE MAKER.*

# Apple's® new ProDOS™ is pro Thunderclock™

When Apple designed their new ProDOS operating system for the Apple II family, they included an important new function—the ability to automatically read a clock/calendar card. Nice touch.

It means that every time you create a new file or modify an existing one, the time and date are automatically recorded and stored in the CATALOG.

Now you can instantly know the exact time your files were last updated.

Apple could have chosen any clock for ProDOS to recognize, but they chose only one.

Thunderclock.

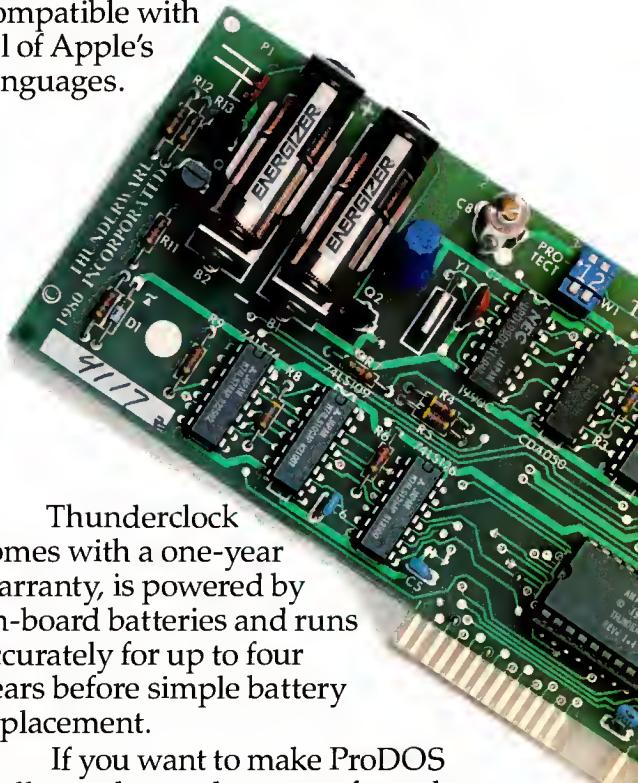
It's the only clock mentioned in the ProDOS manuals.

That's a nice stroke for us, but it's even better for you.

Because, in addition to organizing your disk files, Thunderclock will add a new dimension to all the new ProDOS-based software. For instance, with business or communications

software you can access a data base or send electronic mail automatically, when the rates are lowest. Even when you're not around. And that's just a start. The better you can use your Apple, the better you can use a Thunderclock.

Thunderclock gives you access to the year, month, date, day-of-week, hour, minute and second. It lets you time intervals down to milliseconds and is compatible with all of Apple's languages.



Thunderclock comes with a one-year warranty, is powered by on-board batteries and runs accurately for up to four years before simple battery replacement.

If you want to make ProDOS really produce, take a page from the manual—get yourself a Thunderclock—the official ProDOS clock.

See your dealer or contact us.

Circle 129 on Reader Service card.

 **THUNDERWARE, INC.**

44 Hermosa Avenue, Oakland, CA 94618

(415) 652-1737

® Apple and the Apple logo are registered trademarks of Apple Computer, Inc.

™ ProDOS is a trademark of Apple Computer, Inc.

## Fudge It!

```

0 CLEAR : HOME : TEXT : VTAB 9: HIMEM: 36864
1 ONERR GOTO 63990
2 D$ = CHR$(4)
89 HOME : POKE - 16303,0: POKE - 16298,0: HCOLOR= CL: SCALE= S: ROT= R:
SZ = 0:V1 = 0:S7 = 0
90 WH = 0: POKE 240,0
100 PRINT D$"BLOADFILL4": PRINT D$"BLOADFILLTABLE"
125 GOSUB 43000: GOSUB 20000
150 PRINT D$"BLOADCTABLE"
205 PRINT INPUT "COMBINATION HPLOT SCENE & COLOR-FILL FILE'S NAME: "
;AS: IF LEN (AS) = 0 THEN 205
210 PRINT D$"BLOADA$"
215 GOSUB 21000
220 CALL 7936
490 GET AAS: PRINT CHR$(13): CALL 1002
500 HOME : TEXT : INPUT "WANT ANOTHER SCENE? (Y/N): ";AA$: IF LEN (AA$) =
0 THEN 500
505 WH = 0
510 IF ASC (AA$) = 89 THEN CALL 54915:PK = FRE (0): GOTO 90
520 PRINT CHR$(4)"RUNMENU"
20000 TEXT : FLASH : HOME : PRINT "SWITCH TO DATA DISK.": NORMAL : GOSUB
63000: RETURN
21000 FLASH : PRINT "SWITCH TO PROGRAM DISK.": NORMAL : GOSUB 63000: RETURN
43000 PRINT : INPUT "CHOOSE WIDE (280) OR NARROW (256) SCREEN FILLI
NG (W/N): ";AS: IF LEN (AS) = 0 THEN 43000
43010 WI = 0: POKE 231,0: IF ASC (AS) = 87 THEN POKE 231,1:WI = 1: PRINT
D$"BLOADA3": RETURN
43020 PRINT D$"BLOADA2": RETURN
63000 NORMAL : PRINT : PRINT "(HIT ANY KEY TO CONTINUE)": PRINT
63010 PP = PEEK (- 16384): IF PP > 127 THEN POKE - 16368,0: RETURN
63020 GOTO 63010
63990 POKE 216,0:KP = PEEK (222)
63991 ONERR GOTO 63990
63995 IF KP = 254 THEN RESUME
63997 PRINT ";;";"
63998 CALL 54915
63999 GOTO 89

```

*Listing 6. SCENE RECREATE.*

```

9400- A9 D8 85 FE A2 00 86 E4
9408- A9 FC 85 FC 18 A5 FE 69
9410- 28 85 FE C9 79 90 01 60
9418- E6 FC E6 FC E6 FC E6 FC
9420- A5 FC C9 1B E2 8D 00
9428- 0C 85 E3 E8 BD 00 0C 85
9430- F0 E8 8D 00 0C 85 D7 E8
9438- RD 00 0C 85 1D E8 BD 00
9440- 0C 85 1E E8 BD 00 0C 85
9448- 1F E8 8D 00 0C 85 CE E8
9450- BD 00 0C 85 CF E8 86 FA
9458- A5 FE 85 FD A2 FF A0 00
9460- A5 FD 20 57 F4 A9 00 85
9468- FB 18 65 FC A8 20 C2 94
9470- 91 26 E6 FB A5 FD C9 04
9478- 90 EF A2 FF A0 00 E6 FD
9480- A5 FD 20 57 F4 C6 FD A9
9488- 00 85 FB 18 65 FC A8 E6
9490- FB E6 F8 E6 FB E6 F8 20
9498- C2 94 C6 FB C6 FB C6 FB
94A0- C6 F8 91 26 E6 FB A5 FB
94A8- C9 04 90 DF A6 FA E6 FD
94B0- EB FD A9 26 18 65 FE 85
94B8- EB A5 FD C5 EB 90 4C
94C0- 18 94 A5 FB D0 03 A5 B3
94CB- 60 C9 01 D0 03 A5 F0 60
94D0- C9 02 D0 03 A5 D7 60 C9
94D8- 03 D0 03 A5 1D 60 C9 04
94E0- 03 A5 1F 60 C9 06 D0 03
94F0- A5 CE 60 A5 CF 60 00 00
94F8- 50 50 D8 E0 50 E8 F0 F8

```

*Listing 7. A5.*

```

10 D$ = CHR$(4)
100 HOME : PRINT "(1) PALETTE": PRINT : PRINT "(2) HPDRAW": PRINT : PRINT
"(3) CTABLE MAKER": PRINT : PRINT "(4) SCENE RECREATE": PRINT
115 PRINT "1-4: ";
120 GET AS: PRINT CHR$(13)
200 ON VAL (AS) GOTO 210,220,230,240
206 GOTO 10
210 PRINT D$"RUNPALETTE"
220 PRINT D$"RUNHPDRAW"
230 PRINT D$"RUNCTABLE MAKER"
240 PRINT D$"RUNSCENE RECREATE"

```

*Listing 8. MENU.*

### 2 points!

- 4) Never use button #1 to end a line; use button #0 first.

### Color Table Creation

To use CTABLE MAKER, simply follow the instructions. (PATRN will be needed, so make sure it's on your disk.) Hit button #0 to choose colors, and the paddles for moving the cursor around. Your CTABLE will automatically BSAVE at the end, once 32 choices have been made. Be sure to include black, white, green, violet, orange, blue, brown, dark green and light green. They seem to be needed in most scenes.

### PALETTE Use

PALETTE, as I mentioned, was already discussed in August's *In-Cider*. However, the PALETTE CHANGES listing in this column (Listing 9) gives your old PALETTE program new features. With it, PALETTE not only creates good color-filled 33-sector pictures, it also creates wide or narrow data-file pictures that will store in a few sectors. It even enables you to edit bad color-fills! Here are some of the rules for using this utility:

- 1) Don't fill on top of an area already filled.
- 2) Use quick button hits.
- 3) Don't fill on top of lines.
- 4) Keep in mind that the filling will begin just beneath the cursor (towards the bottom of the screen).
- 5) Use E to edit a bad fill, but don't do it unless there are at least two fills completed already.
- 6) Use framed drawings, or at least start filling at the right side of the screen and move leftwards.
- 7) Try to avoid creating line drawings with sharp angles to fill, although correct "paintbrush" use can fill those places and allow you to save at least a picture, if not data files. Paintbrush instructions are in the program.

Here's how to create a data-file picture (after you've made the changes in the August PALETTE program):

- 1) Draw a line drawing with

# Something no modem has ever said before.



If you're looking for a premium modem without a premium price, here's a word of advice: Apple.

Introducing the Apple® Modem 300. And, to keep up with the business world, our faster Apple Modem 1200.

Inside, they're packed with all the technical wizardry you would want in an intelligent modem. Auto-dial. Auto-answer. Built-in error diagnostics.

And compatibility with all the latest advanced communications software.

But the real message is located outside, due north of the little green light.

That one familiar symbol tells you as much as a gigabyte of specs. It says Apple quality. Apple technology. And in the unlikely event you should need it, Apple service.

It also means total compatibility with whatever Apple you own. Particularly since we include the right accessory kit to get any system in our line on line. Immediately.

We even give you a subscription offer to THE SOURCE™ and a free demonstration of CompuServe. Together, they let you access almost any subject known to mainframes.

For an authorized Apple dealer nearest you call **(800) 538-9696**. In Canada, call **(800) 268-7796** or **(800) 268-7637**. ©1984 Apple Computer, Inc. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. CompuServe is a registered trademark of CompuServe Corp. THE SOURCE is a servicemark of Source TeleComputing Corporation, a subsidiary of The Reader's Digest Association, Inc.



*As you'll notice, the Apple Modem is hardly noticeable under a desk phone.*

News reports. Dow Jones averages. Sports scores. Closing prices on pork bellies.

You can send electronic mail. Play games. Bank at home. Make friends. Influence people. Find the lowest air fares for business trips. Or do almost anything else you like.

And since the computer age happens to coincide with the plastic age, you can charge your Apple Modem with an Apple Credit Card.

Which, along with the low price, makes buying an Apple Modem as much fun as using one.

That's something no modem has been able to say before, either.



*The cable, phone cord and power supply are all included. And we offer a serial interface card for the Apple IIe at an unusually reasonable price.*

Soon there'll be just two kinds of people. Those who use computers. And those who use Apples.



# Fudge It!

```

2 K=3072:WI = 1
4 PP = PEEK (-16384): IF PP > 127 THEN POKE -16368,0: IF PP
  <> 160 THEN HGR: POKE -16302,0: GOTO 50
5 IF SZ = 1 THEN 24
7 IF Z9 = 0: IF Z9 = 0 THEN Z9 = 1: HGR2: GOSUB 300: GOTO 10
10 GOSUB 190: X = 139: GOTO 89
15 RETURN
24 Z9 = 0: VV = 3072: HCOLOR= 0: IF Z9 = 0 THEN Z9 = 1: HGR2:
  PRINT DS"LOADADAS": CALL 27888: PRINT DS"LOADFILLTABLE" 25
  POKE -16299,0: POKE -16304,0: POKE -16297,0: GOSUB 190: X=
  139: GOTO 900
50 CL = 3: S= 1: R= 64: X= 139: Y= 79: D$= CHR$(4): HOME: 88
  = 0: XS=""": GOTO 89
89 HOME: POKE -16303,0: POKE -16298,0: HCOLOR= CL: SCALE= S:
  ROT= R: VI= 0
92 PRINT "(12)CREATE COLOR-FILL TABLE": PRINT "(13)GO TO SCAN
  AND SAVE SHAPE": PRINT "(14)SAVE 34 SECTOR SCREEN
  PICTURE": PRINT "(15)ERASE SCREEN": PRINT "(16)SEE
  COLOR BYTE #": PRINT "(17)MYSTERY COLOR"
98 ON ZZ GOTO 100,110,1100,1200,1300,1600,1700,1800,400,7,900
  ,8000,9000,10000,11000,12000,13000
100 HOME: PRINT "(1) PALETTE": PRINT: PRINT "(2) HPDRAW":
  PRINT: PRINT "(3) CTABLE MAKER": PRINT: PRINT "(4)
  SCENE RECREATE": PRINT
111 IF ZZ = 0 THEN FLASH: PRINT "NOW SWITCH BACK TO THE
  PROGRAM DISK!" NORMAL: GOSUB 63000
113 IF ZZ= 0 THEN PRINT DS"RUNMNU"
115 PRINT "1-4: ";
120 GET AS: PRINT CHR$(13)
190 POKE 232,192: POKE 233,3: POKE 960,1: POKE 961,0: POKE
  962,4: POKE 963,0: POKE 964,60: POKE 965,54: POKE 966,0:
  ROT= 0: SCALE= 1: IF VV= 1 THEN VV= 0: RETURN
200 P0= 1.09 * PDL(0): P1= .75 * PDL(1): IF P0+ 18 < 280 THEN
  XDRAW 1 AT P0,P1: XDRAW 1 AT P0+ 18,P1: FOR QW= 1 TO 100:
  NEXT: XDRAW 1 AT P0 + 18,P1: XDRAW 1 AT P0,P1: O= PEEK (-
  16336)
206 GOTO 10
210 PRINT DS"RUNPALETTE"
218 CN= (INT(P0/28) + (INT (P1/40) * 8))*8
220 PRINT DS"RUNHPDRAW"
230 PRINT DS"RUNCTABLE MAKER"
240 PRINT DS"RUNSCENE RECREATE"
565 PRINT: FLASH: PRINT "SWITCH TO YOUR PROGRAM DISK.":
  NORMAL: GOSUB 63000
903 POKE 6,A: POKE 7,B: POKE 8,C: POKE 9,D: POKE 220,E: POKE
  221,F: POKE 222,G: POKE 223,H
910 P0= PDL(0) + INT((.09 * PDL(0)) * WI): P1= INT(.75 * PDL
  (1)): GOSUB 1500: XDRAW 1 AT P0,P1: FOR QW= 1 TO 100:
  NEXT: XDRAW 1 AT P0,P1: IF VI= 0 THEN Z= PEEK (-16336)
916 P9= PEEK (-16384): IF P9 < 127 THEN POKE -16368,0: IF P9 <
  155 AND P9 < 195 AND P9 < 197 THEN GOSUB 1500
918 PP= PEEK (-16286): IF PP < 127 AND SZ= 0 THEN HOME: GOTO 89
919 IF PP > 127 AND SZ = 1 THEN 7
920 PP= PEEK (-16287): POKE 240,0
922 IF PP>127 AND SZ= 0 THEN 950
924 IF P9 = 197 THEN V= V-(3*WI): VI= VI-1: POKE AD,VI: P9=0:
  POKE 231,VI: CALL 7936: SCALE= 1: ROT=0: GOTO 900
925 IF P9= 155 THEN 985
930 ROT=0: SCALE= 1: XDRAW 1 AT P0,P1: POKE 237,PEEK(48):
  XDRAW 1 AT P0,P1: CALL 36864
955 IF SZ= 0 THEN 980
956 IF WI= 1 THEN POKE V,P0 - 256 * (P0>255): V= V + 1: POKE
  V,(P0+255): GOTO 958
957 POKE V,P0
958 V= V+1: POKE V,P1: V= V+1: POKE V,CN: V= V+1
960 VI= VI + 1: IF VI > 254 THEN 985
985 POKE AD,VI: SZ= 0
990 HOME: TEXT: INVERSE: PRINT "HIT CTRL-C IF YOU SO NOT WANT
  TO SAVE": NORMAL: INPUT "NAME OF COMBINATION HPLOT/COLOR-
  FILL FILE": ; AS: IF LEN (AS)= 0 THEN 990
995 GOSUB 20000
999 PRINT DS"BSAVE"AS",A"AR",L"(V+1) - AR: PRINT AS: PRINT
  "A"AR: PRINT "L"(V+1)-AR: GOSUB 63000: GOTO 565
8000 HOME: INPUT "NAME OF HPLOT SCENE FILE: ";AS: IF LEN (AS)=
  0 THEN 8000
8005 POKE 250,0: POKE 251,13
8008 GOSUB 20000
8010 PRINT DS"LOAD"AS: V= PEEK(43634)+ PEEK(43635) * 256: AR
  = V: V= V+ PEEK (43616) + PEEK (43617) * 256: AD = V: V=
  V+1: SZ=1: PRINT DS"LOAD CTABLE"
8015 INVERSE: PRINT: PRINT "SWITCH TO PROGRAM DISK.": NORMAL:
  GOSUB 63000: GOSUB 43000: CALL 848: GOTO 89
20000 PRINT: INVERSE: PRINT "SWITCH TO YOUR SCENE DISK.": ;
  NORMAL: GOSUB 63000: RETURN
43000 HOME: TEXT: INPUT "CHOOSE WIDE (280) OR NARROW (256)
  SCREEN FILLING (W/N): ";AS: IF LEN(AS)= 0 THEN 43000
43010 WI = 0: IF ASC (AS) = 87 THEN WI = 1: PRINT DS"LOADADAS"
  : RETURN
43020 PRINT DS"LOADAD2": RETURN

```

*Listing 9. PALETTE CHANGES.*

HPDRAW, and remember if it is narrow or wide.

2) Go to the menu, and then to PALETTE, hitting return to erase the screen during entry. (And, if you make more than one data file in a row, use option 15 to erase the

screen between pictures.)

3) Use option 12 to begin creating a color-filled data file.

4) Specify narrow or wide when asked—it must be correct. (This refers to the line drawing you'll be

loading at this point; it was saved as NARROW or WIDE.)

5) Select option 10, CHOOSE A PALETTE COLOR. (Make sure you've used CTABLE MAKER to create a color table, or it won't work.)

6) Move the double cursor around and select a color with button #0.

7) Read the instructions.

8) You'll now be color-filling your line drawing with the use of the paddles. Use paddle button #0 to fill and paddle button #1 to choose a new color, C to see your coordinates and color-byte colors, and E to edit (if you've made at least two fills).

9) Hit escape to exit and control-C to restart if you don't want to save the scene.

10) Erase the screen between scene-fills, unless you want to save a bizarre 33-sector picture of a surreal variety.

## Use of SCENE RECREATE

This utility enables you to recreate your scenes quickly and efficiently. It's possible to use the guts of this program, in a one-line condensed form, as a GOSUB in your own Applesoft programs, so you can load and display scenes conveniently. Make sure 240 is POKE'd with 0, and 231 is POKE'd with 1 for wide- or 0 for narrow-screen line drawings.

## Uncolored Scenes

To use the enclosed utilities to create line drawing scenes that are not colored, you need only BLOAD your line drawing data files at \$D00, BLOAD A2 (narrow) or A3 (wide), and type CALL 848 to get your line drawing on the screen. Make sure HGR and HCOLOR=3 are in place.

The HPDRAW utility lets you not only create line drawings, but also reload data files and display the drawings (narrow or wide)—and you can even edit them! The editor will be a surprise for you. It takes a while to learn how to use it effectively—it's rather strange. But it is effective if used right. Let's see if you can figure out what to do with it. Life needs some challenge. One hint: Use option 3 first.

See you next time! ■

# KEY TRONIC POLISHES THE APPLE II\* KEYBOARD



Eleven Function Keys  
Streamline Multiple  
Key Operations

Full Shifting Capability

Keys in Familiar  
Typewriter Locations

Numeric Pad

10 Foot Cable  
For Portability

Enhance your APPLE II\* Computer System with a Key Tronic keyboard peripheral. This detached, low-profile keyboard is plug-compatible with the existing keyboard socket of the Apple II. It also features reliable microprocessor electronics, solid-state capacitance switches, and positive tactile feedback.

Special keyboard available for the handicapped — factory direct.

\*Apple II is a registered trademark of Apple Computer, Inc.

Suggested Retail Price: \$298.00

To order Model KB-200 call Toll Free 1-800-262-6006  
for the retailer closest to you. (7am-3pm Pacific Time)  
Warranty information may be obtained, free of  
charge, by writing to the address below.



THE RESPONSIVE KEYBOARD COMPANY

DEPT. E1 • P. O. BOX 14687 • SPOKANE, WASHINGTON 99214 USA

RETAILERS: For the Distributor in your area, call Toll Free 1-800-262-6006 Dept. D (7am-3pm Pacific Time)

Circle 511 on Reader Service card.

by Brian J. Murphy

# Baby's First Computer Program



The other day, while holding my seven-month-old daughter Elizabeth on my knee and trying to test-play a game for an *inCider* review, the motion of my fingers across my Apple keyboard caught Elizabeth's attention. She promptly joined in the fun, banging her little hand down on the keys.

Like a good Daddy I didn't get angry with her, but shifted my position

so she couldn't play with the keyboard while I was using it. But the incident opened up a whole new line of thought.

Piaget, the Swiss child psychologist, said that children are born with a healthy curiosity that parents and schools tend to squelch. At first, all children want to probe, poke, taste, pound, tear and generally explore their environment, a trait which Pia-

get believed we should encourage.

### Don't Touch the Computer!

Consider now computer phobia, a fear of computers. Parents, fearful of damage to their systems, teach their children not to touch their precious machine. The fear of punishment and disapproval for touching the system may well carry over to school, making it more difficult for teachers

to use computers effectively and jeopardizing your child's progress.

Clearly, it is better for children to use computers early on, under controlled conditions. Since the earlier you start the better, here's a simple program, Baby's First Computer Program, I wrote and then tested with the assistance of my little girl.

### How It Works

Every time the baby strikes a character key or the space bar, the computer clears the low-resolution color graphics screen and then fills it with a solid color. Even if you hit the same key repeatedly, the screen clears to black before the color appears, making the display flashy and exciting for baby.

Each character key is coded for a specific color. The escape, return and arrow keys display black. The program uses a get routine to bypass the



carriage return after each input, allowing baby to bang away at the keys and get a continuous light show.

At first, I thought my seven-month-old girl would be unable to use the program, but she perked up the instant she saw the colors flashing on the screen. First she used the flat of her hand to make the colors change, but in time she actually used her index finger to depress individual keys.

### Benefits

This program, for children seven months to three years old, demonstrates that the computer is all right to play with when an adult is supervising. It also helps to teach cause and effect relationships. You can teach the alphabet and numbers by pointing out which colors you get when you depress specific keys. But, best of all, the program provides entertainment for you and your baby, and that's the most important thing.

After you've typed in the code (it takes about a half hour), simply type the command RUN. The program begins at once, without a title page. It is a continuous loop program and requires a reset to interrupt. Have fun! ■

*You can write to Brian Murphy and his daughter at 133 Post Road, Fairfield, CT 06430.*

```

498 GET A$
499 GR
500 IF A$ = "A" THEN COLOR= 1
501 IF A$ = "S" THEN COLOR= 2
502 IF A$ = "D" THEN COLOR= 3
503 IF A$ = "G" THEN COLOR= 5
504 IF A$ = "F" THEN COLOR= 4
505 IF A$ = "H" THEN COLOR= 6
506 IF A$ = "J" THEN COLOR= 7
507 IF A$ = "K" THEN COLOR= 8
508 IF A$ = "L" THEN COLOR= 9
509 IF A$ = ";" THEN COLOR= 10
510 IF A$ = "X" THEN COLOR= 12
511 IF A$ = "Z" THEN COLOR= 11
512 IF A$ = "C" THEN COLOR= 13
513 IF A$ = "V" THEN COLOR= 14
514 IF A$ = "B" THEN COLOR= 15
516 IF A$ = "N" THEN COLOR= 1
517 IF A$ = "M" THEN COLOR= 2
518 IF A$ = "M" THEN COLOR= 3
519 IF A$ = " , " THEN COLOR= 4
520 IF A$ = ". " THEN COLOR= 5
521 IF A$ = "/" THEN COLOR= 6
522 IF A$ = "Q" THEN COLOR= 7
523 IF A$ = "W" THEN COLOR= 7
524 IF A$ = "E" THEN COLOR= 8
525 IF A$ = "R" THEN COLOR= 9

```

```

526 IF A$ = "T" THEN COLOR= 10
527 IF A$ = "Y" THEN COLOR= 11
528 IF A$ = "U" THEN COLOR= 12
529 IF A$ = "I" THEN COLOR= 13
530 IF A$ = "O" THEN COLOR= 14
532 IF A$ = "P" THEN COLOR= 15
533 IF A$ = "1" THEN COLOR= 1
534 IF A$ = "2" THEN COLOR= 2
535 IF A$ = "3" THEN COLOR= 3
536 IF A$ = "4" THEN COLOR= 4
537 IF A$ = "5" THEN COLOR= 5
538 IF A$ = "6" THEN COLOR= 6
539 IF A$ = "7" THEN COLOR= 7
540 IF A$ = "8" THEN COLOR= 8
541 IF A$ = "9" THEN COLOR= 9
542 IF A$ = "0" THEN COLOR= 10
543 IF A$ = ":" THEN COLOR= 11
544 IF A$ = "-" THEN COLOR= 12
545 IF A$ = " " THEN COLOR= 1
1002 ZZ = 1
1006 HLIN 0,36 AT ZZ
1008 ZZ = ZZ + 1
1010 IF ZZ = < 40 THEN GOTO 10
06
1011 PRINT "
1012 GOTO 498

```

*Program listing.*

# BILL BUDGE:

## Pinball's All-Time High Scorer

by Sam Whitmore



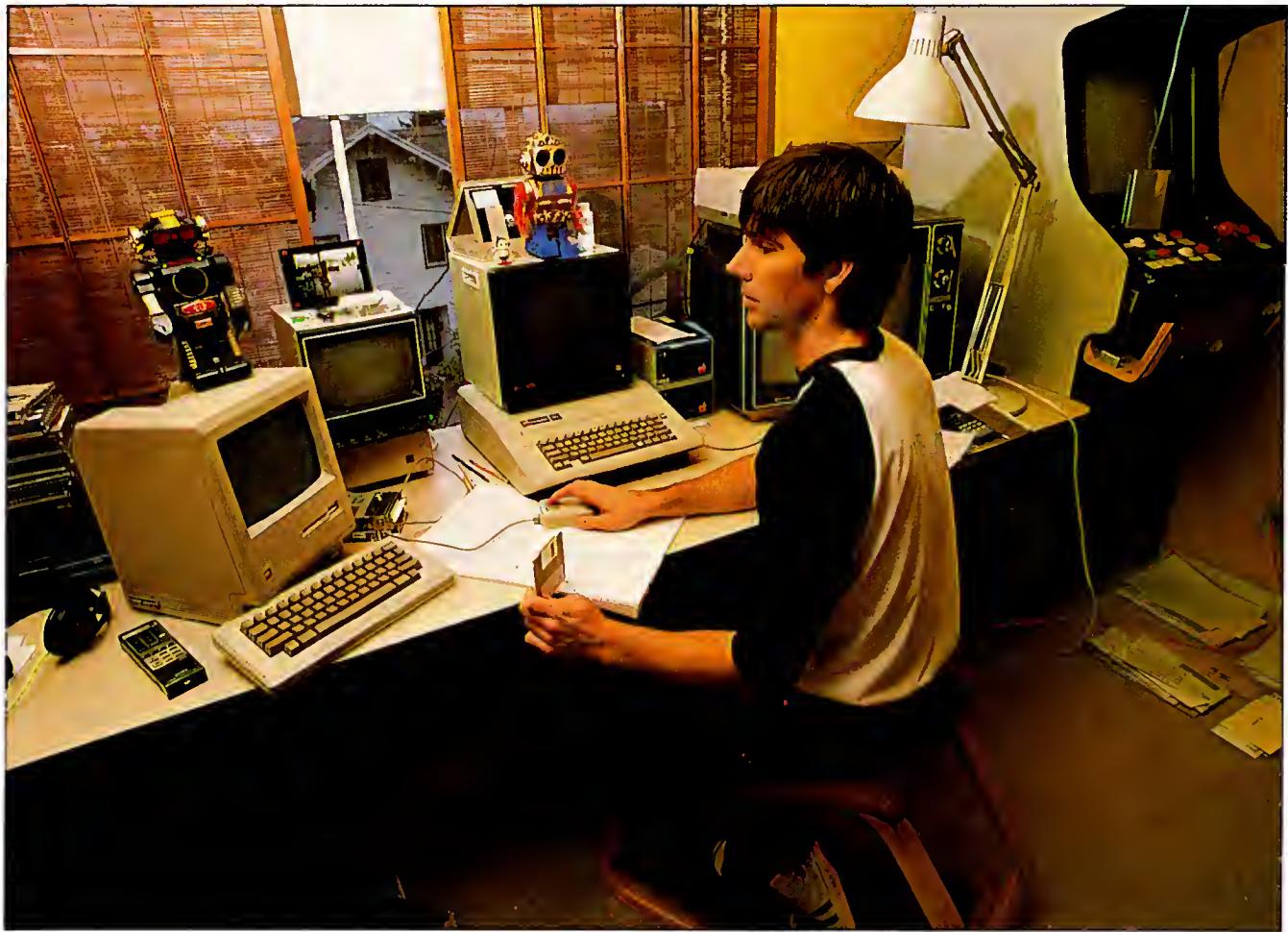
**B**ill Budge wants to be famous. To many he already is. When Apple Computer's Steve Wozniak described Budge's "Pinball Construction Set" as the best program ever written for an 8-bit computer, most microcomputer industry observers couldn't help but notice this photogenic, 30-year-old manchild.

"I don't want to just be famous," Budge says from his \$200,000 home in Piedmont, California. "I want to write programs that will make me famous. I don't want to be recognized on the street, or be famous just for being famous. I just want to be respected for

**"I want to write  
programs that will  
make me famous."**

**"I just want to be  
respected for  
my craft."**

**"Apple wants me  
to do MousePaint  
for the III . . ."**



my craft."

Budge's reputation rests thus far on two top-selling pinball programs. Shortly after leaving his job on Apple's Lisa project in 1981 Budge wrote "Raster Blaster," at that time a state-of-the-art adaption of pinball to the personal computer.

In 1982 Budge signed up with Electronic Arts (see related story) and created "Pinball Construction Set." This near-legendary program allows players to construct their own pinball game using endless combinations of bumpers, balls and flippers, and to define the game's physical properties like ac-

tion (how fast the ball bounces around) and gravity (how fast gravity pulls the ball down).

Budge's colleagues marveled at his ability to cram large amounts of computer instructions into an astonishingly small amount of memory. They were thunderstruck by the very idea of a "construction set" and the possibilities it presented.

"The main reason everyone respects Bill Budge is because he's not arrogant or a braggart," says Electronic Arts president Trip Hawkins, himself a former Apple employee and a friend of Budge's. "Bill doesn't let it all go to his

head, and he easily could."

Budge likes to stay busy. He writes a monthly column for a computer magazine and periodically visits large national retailers—as his Electronic Arts retainer specifies—to promote Electronic Arts games.

Last winter Apple Computer "borrowed" Budge, contracting him to adapt Macintosh's "MacPaint" graphics program to the Apple IIe and another Apple machine he declined to

---

**"I'd rather concentrate on the Macintosh."**

---

---

**"It's really a set of software development tools."**

---

---

**"I admit they won't have the payoff of a video game . . ."**

---

---

*Write to Sam Whitmore at 1 Clinton Ave., Danvers, MA 01923.*

---

specify (a new portable?). The new program, called "MousePaint," will be available later this year.

"Bill Atkinson [author of MacPaint] already did most of the work for me," Budge says. "Getting it on the IIe was more fun than anything else. Apple wants me to do MousePaint for the [Apple] III, which they say is shipping 2500 units a month. If that's the case, it probably would be worth it."

"To tell you the truth," he says, "I'd rather concentrate on the Macintosh."

Budge says he had a Mac months before its official release, and that it was love at first sight. "The Macintosh gives every program a consistent user interface, so that if you learn one program, you're familiar with all the others."

"The best part is that, as a programmer, I no longer have to write the software that makes up that user interface. It's all in ROM. So twenty percent of the programmer's work is eliminated right off the bat."

Budge will use the Mac to develop his next big project for Electronic Arts, which he describes as a "construction set construction set."

"It's really a set of software development tools," he explains. "I suppose I'll be sitting down with the marketing people to decide whether to release it as a product, or hang on to it and use it to develop even more products."

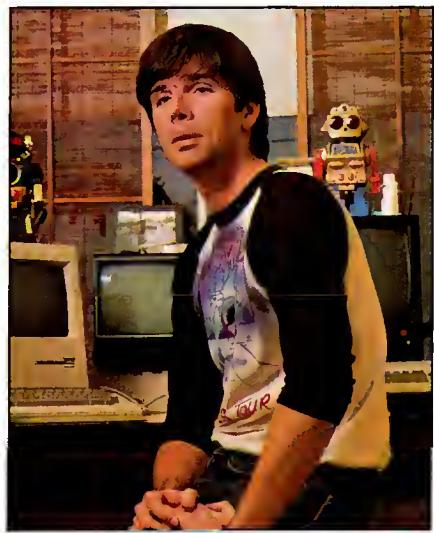
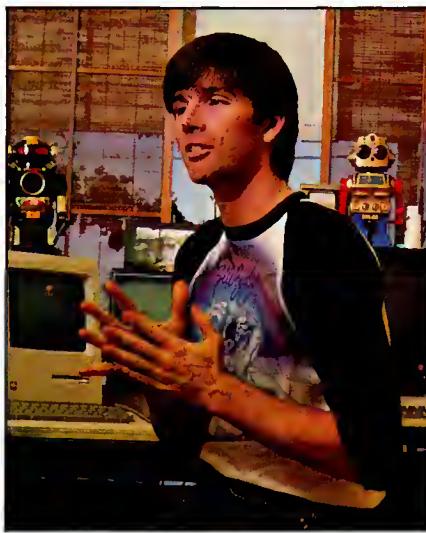
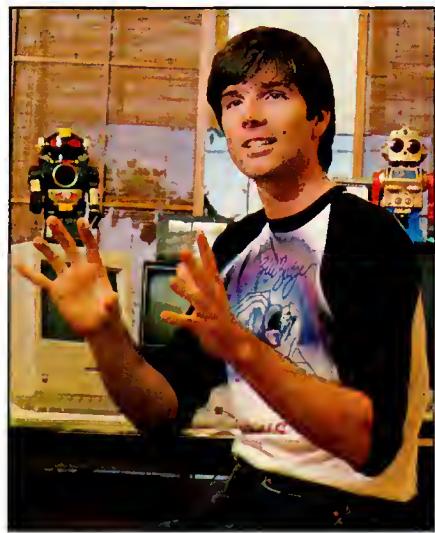
When the project is completed, Budge explains, users will have at hand the technology to develop their own kinds of construction sets. For

less-inventive users, Budge says he's working on ready-made model rocketry, dance, football play, office furniture, model train and roller coaster construction sets.

"The problem is, you can't make a program too difficult for the average person to use," Budge says. "Playing with a construction set is a lot like playing with a programming language—some will be better at it than others."

"All I can say is that if [the construction sets] are impossible for people to use, they won't come out. If I can simplify them enough, they will."

What will these construction sets actually do? "People can just play with them," Budge responds. "They'll be animation kits. I admit they won't



**"Twenty percent of  
the programmer's  
work is  
eliminated . . ."**

**"You can't make a  
program too  
difficult for the  
average person  
to use."**

**"The Macintosh  
gives every  
program a  
consistent user  
interface . . ."**

have the payoff of a video game, but visually, they'll be much more exciting."

In the future, he says, programs will incorporate "real world" knowledge. "For example, the Pinball Construction kit doesn't really do anything—it just simulates a world where you can build things with bumpers and parts, but it doesn't ever try to tell you to do this or that," he says.

"Programs gradually will become more and more interactive, until some day people will wake up and say, 'Hey, these computers are pretty smart.'"

They may be smart, but they won't be as smart as people. "Getting a computer to understand what you say is one thing," he says, "and getting it to understand what you mean is

another."

Relates Budge: "Not too long ago two Carnegie-Mellon scientists wrote a program to enable a computer to analyze newspaper articles. To test it out they read it a story about the Pope's trip to a village ravaged by an earthquake. Well, after assessing the story, the computer concluded that the Pope was injured by the earthquake, or had somehow caused it. So at this point, there's little danger of science creating dangerous new intelligences more powerful than our own. We're protected from that by the difficulty of doing it."

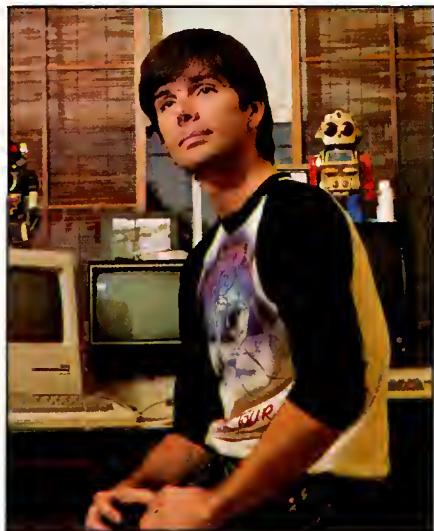
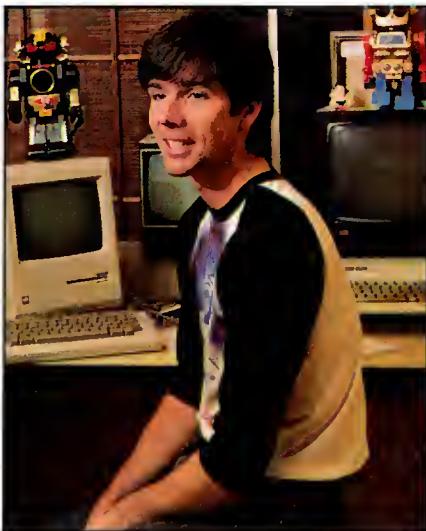
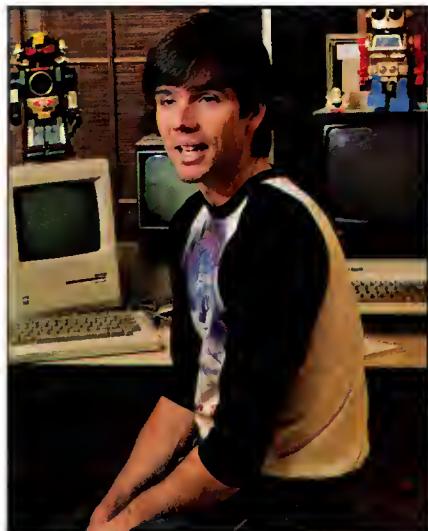
Budge, then, doesn't worry about the high-tech boogeyman—or much else, for that matter. He enjoys *Leave It to Beaver*, punk clothing and sci-

ence fiction. His business is monkey business.

"I hang out with the Macintosh people," he explains. "For fun we walk into an Apple dealership and ask the salesman all kinds of questions about the Mac. And I'll say, 'Hey, I hear the IBM PC is way better than this,' and then we watch 'em to see how they handle it."

"Or other times I get talking to pirates, and the pirates will say, 'Yeah, I have all of Budge's programs.' And I ask them how they did it, and they go on and on about how they did it—right to my face! Then I let them know who they're talking to, and you should see their faces. It's great fun."

Bill Budge is synonymous with fun. Long may he program. ■



**"Then I let them know who they're talking to, and you should see their faces."**

**"Programs gradually will become more and more interactive . . ."**

**"The Pinball Construction kit . . . simulates a world . . ."**

# ANNOUNCING

## the premiere of

jr®

Learning to use your *IBM PCjr* becomes easy and fun with **jr** magazine. Because **jr** keeps things simple, the whole family will *learn and understand while they enjoy themselves.*

**jr** will explain how the *PCjr* works and guide you step-by-step in setting up your system. Most of all **jr** will answer your most important questions month after month...like

- **What can I use my *PCjr* for?** *jr* magazine will teach you how to prepare household budgets, balance your checkbooks, do your taxes and organize schedules and lists.

- **What about the kids?** From kindergarten to college, **jr** helps the kids with educational programs in every subject area.

- **Are there more serious uses for *PCjr*?** Yes! You'll improve your own business skills by learning about word processing, spreadsheets and graphics.

- **What about having fun with *PCjr*?** Relax and enjoy all the latest games with your whole family.

*Plus:*

- **What programs should I choose for the *PCjr*?** *jr* magazine will tell you what programs on the market will run on the *PCjr*, and which ones won't. Plus what new programs are on the way. **jr** will evaluate them before you buy.

Order your subscription to **jr** today and you'll get the special charter subscription rate of \$14.97. That's 25% off the basic subscription rate! Plus, with your pre-payment of check, American Express, Visa or Mastercard we'll send you a FREE issue making a total of 13 issues for \$14.97.

Take advantage of this incredible charter subscription offer. Mail the attached card, the coupon or call TOLL FREE 1-800-258-5473. In New Hampshire call 1-924-9471... TODAY!



Sign me up as a charter subscriber to **jr**.  
I understand that with prepayment of check or  
credit card I'll receive a FREE issue making a total  
of 13 issues for \$14.97. Save \$5.00 off the basic rate!

CHECK/MO  MC  AE  VISA  BILL ME

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Canada & Mexico \$17.97, 1 year only, US funds drawn on US bank.  
Foreign Surface \$34.97, 1 year only, US funds drawn on US bank.  
Foreign airmail, please inquire. Please allow 6-8 weeks for delivery.

**jr** For IBM's Home Computer  
Box 903 Farmingdale, NY 11737

# Electronic Arts

**Trip Hawkins has a successful game plan for his company. He has put the newest marketing together with the best programmers.**

by Sam Whitmore

Americans spent \$2 billion on microcomputer software in 1983, research says, and they'll spend close to \$3 billion in 1984. That's a lot of cabbage—almost as much as the record and tape industry takes in. Therefore, software companies that can build an identity, create interesting, useful programs and market them intelligently are going to do very well. Electronic Arts can be one of those companies.

"Electronic Arts believes in cherishing creative talent and good ideas," says president Trip Hawkins. "We're totally committed to independent thinkers who have an obsession to create works of art."

Now there's a word that's been beaten to death—art. "We really do believe that what people like Bill Budge (see related story) do is an art form," asserts Hawkins. "We've tried to attract independent software artists who fit the mold. I'm talking about somebody who needs creative freedom so strongly that they don't want to be an employee of a company. It doesn't make any sense for a guy with Bill Budge's talent to stop for a moment and think about manufacturing, packaging, distribution, manuals, marketing and those things. The whole idea of Electronic Arts was to set up a company that can get done all the things necessary for our artists to get their products to the world."

This is not mere rhetoric. In only two years Hawkins has established for Electronic Arts a distinctively packaged product line, an equally distinctive marketing strategy and a reputation as a source of state-of-the-art programs. The ten Electronic Arts programs available for the Apple II line come packaged in laminated 10-inch record jackets replete with liner notes about the program, the artist and a bit about Electronic Arts itself. Their conventional design allows the software

packages to be displayed in record bins, which attract many millions of discretionary dollars annually. In computer stores, the programs are stocked in a slick chrome-and-plexiglass display case that Hawkins calls "the gallery." To combat pilferage, the jackets don't contain the floppy disk, but the buyer can peruse the liner notes to judge whether the program is interesting.

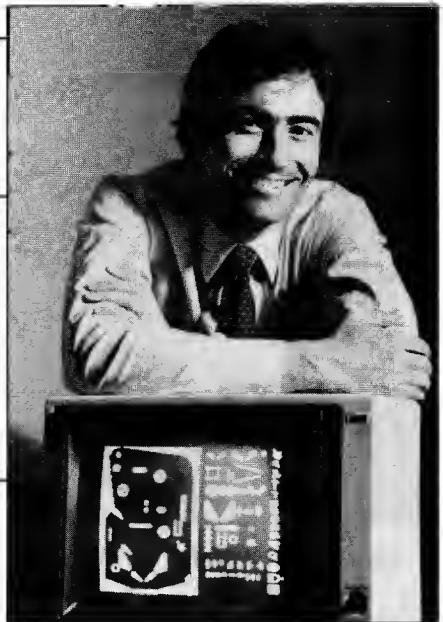
"Our intention was to encourage people to buy our products without requiring a demonstration," Hawkins says. "We wanted to give a feeling for the product through the packaging."

Electronic Arts brings the same innovative spirit to its marketing. Software companies usually use distributors to market their wares. Distributors buy products in bulk from manufacturers, mark up the price and in turn resell the products to retail stores. Manufacturers choose this method because they can get cash for their products quickly and can delegate to the distributor the responsibility of keeping retailers' shelves stocked.

## Daring to be Different

Electronic Arts sells its software directly to retailers, skipping the middleman. Hawkins says this personal touch often transforms retailers into Electronic Arts sales reps. "It's too expensive to advertise enough so that people will buy your software," he says. "You can't go on television and say, 'Run out and buy Pinball Construction Set,' because most people don't have a computer in the first place. So we try to show the retailers that we adhere to good business practices, that we have consistently good products and that we support those products with lots of merchandising."

In 1978, as an Apple employee, Hawkins watched his company painfully dissolve its relationships with six



*Electronic Arts president Trip Hawkins with Pinball Construction Set.*

national distributors in order to inaugurate its own 200-store dealer network. The move gravely wounded the distributors, who were raking in millions. Three of the distributors sued Apple, and in the course of litigation neglected to pay Apple for the computers they already had bought.

"It's more expensive and more trouble, but if you believe that you're going to be a big company, it's better to go direct from the start," Hawkins says. "Distributors are concerned most with turning over their inventory. By law they're not required to observe your suggested list price, and they tend to 'cherry pick,' which means they'll take only the top sellers of your product line. Things like that prevent us from fully defining what Electronic Arts has to offer."

Hawkins says Electronic Arts takes an equally dim view of electronic distribution firms like PC Telemart of North Andover, Massachusetts and Xante Corp. of Tulsa, Oklahoma, the two early leaders in this fast-growing industry. To become part of an electronic distribution network, retailers install computer terminals in their stores. Customers use these terminals to order software from a central mainframe computer, which processes the order and transmits the desired software back to a floppy disk inside the retailer's terminal. Dot-matrix documentation and generic packaging are provided at the point of sale.

*Write to Sam Whitmore at 1 Clinton Ave., Danvers, MA 01923.*

*Save 44% off the newsstand price!*



# THESE COULD BE THE KEYS TO YOUR FUTURE

Unlock *all* the potential of your Commodore 64 and VIC-20\* with RUN.

Explore...Experiment...Enjoy... Beginner and expert alike will be taken beyond the manual to the limits of their abilities. Enter your own game programs. Construct a simple hardware add-on. Broaden your scope with unique applications...And...get a 13th issue FREE!

Enjoy key features like these:

- Games for fun & strategy.
- Programming tips help you learn short cuts.
- Candid reviews help you make money-saving decisions.
- Programs to add to your library.
- Instructions & tutorials to increase your skills.
- Hardware & software modifications help your machine work smart.
- Unique applications broaden your scope.

Here's a system-specific magazine written with you in mind. Written by and for the reader to give time-saving, money-saving hints. You'll get instructions and tutorials to increase your skills, and candid reviews to help you make the right decisions. Most of all though, you'll have fun.



Commodore 64 and VIC-20 owners are one of the largest groups of computerists today.

Enjoy the benefits of this with your own magazine. Be in control like never before. Order

RUN today and get a 13th issue free with your prepaid order (check or credit card) of only \$19.97. Send in the coupon or call toll free 1-800-258-5473. In N.H. call 1-924-9471.

*Send me a subscription to RUN for the regular subscription price of only \$19.97 per year. I understand that with payment enclosed or credit card order I will receive a FREE issue making a total of 13 issues for \$19.97.*

CHECK/MO  MC  AE  VISA  BILL ME

card # \_\_\_\_\_ exp. date \_\_\_\_\_

signature \_\_\_\_\_

name \_\_\_\_\_

address \_\_\_\_\_

city \_\_\_\_\_ state \_\_\_\_\_ zip \_\_\_\_\_

Canada & Mexico \$22.97; Foreign Surface \$39.97, 1 year only, US funds drawn on US bank. Foreign airmail, please inquire. Please allow 6 to 8 weeks for delivery.

**RUN • Box 954 • Farmingdale, NY 11737**

"We want no part of electronic distribution," Trip Hawkins says. "I can't foresee retailers forking out \$15,000 to buy the machine and even more to keep it running, and I certainly can't see customers accepting the idea. I believe that people like the idea of going to a store, taking a product off the shelf and buying it. Using electronic distribution for software is like going into a record store, inserting a blank cassette into a machine and waiting for the machine to record the album for you. Who wants to do that?"

#### Star Programs

The real question should be: Is Electronic Arts software worth seeking out? In a word, it depends. The company does market unusual and enjoyable computer games. (Read about "Pinball Construction Set" in the accompanying article.) "Dr. J and Larry Bird Go One-on-One," written by Eric Hammond, is an unsurpassed computer simulation that equips an offensive player and a defensive player (or the Apple itself) with the programmed abilities of those two basketball superstars.

"Will Harvey's Music Construction Set" allows the user to arrange notes, sharps, flats, rests and other musical symbols onto a staff and have the Apple play that melody. Compositions can be saved to disk or immediately can be rearranged and played back. Music Construction Set can be fun for both musicians—who can use it to write their compositions—and for plain old music appreciators.

One of these days Electronic Arts will market a program conceived by pop artist Gahan Wilson. The technology to implement Wilson's bizarre ideas still hasn't arrived, Hawkins reports, but Wilson remains optimistic, and the best minds in San Mateo are working on the project.

Otherwise, Electronic Arts displays no more character than most of its rivals. It does boast critically well-received arcade games like Archon and M.U.L.E., but its children's educational programs and "home management" packages are mundane at best. Indeed, the better part of Electronic Arts' character rests in its image as star-making machinery for its programmers.

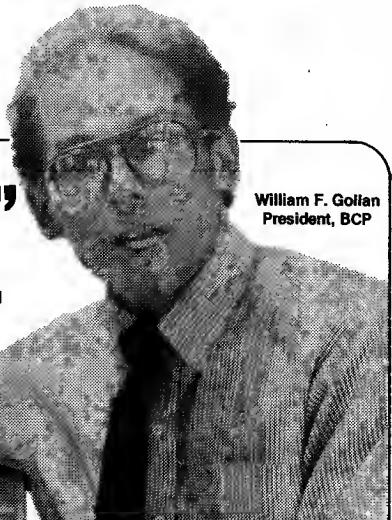
"I think we're being misrepresented," Hawkins says. "When you go back and look at things I've said or look at any of our advertisements, we don't use the word 'star' when we refer to our programmers. We use the word 'artist.'"

Words aren't the issue; what Electronic Arts really stands to gain is the ability to "presell" its programs. Just as a book publisher counts on revenue from a

famous author's forthcoming novel, software publishers one day will bank on a famous programmer's forthcoming program. Electronic Arts wants to create for gifted programmers the reputations they deserve, and then take those reputations and make a few bucks on them. That's no crime. That's life in the big city, which Electronic Arts happens to make a little bit more enjoyable. ■

## "We will match any mail order price in this issue."

We'll support, service and warranty everything we sell and stand behind it 100%. We won't charge you for shipping or handling, nor will we penalize you for using a credit card.



William F. Gollan  
President, BCP

COMPUTERS		PRINTERS DOT MATRIX	
Franklin Ace 1000	\$ 789.95	Franklin Ace 1200 OMS	<b>\$ 1469.95</b>
MONITORS		<b>Epson RX 60 F/T</b>	
Amdek 300 A	\$159.95	Amdek Color III +	\$369.95
Amdek Color I +	299.95	USI Pi 3 12" A	159.95
Amdek Color II +	439.95	USI Pi 4 9" A	145.95
MODEMS		<b>Epson RX 100</b>	
DC Hayes		Novation Apple Cat II	\$279.95
Smarimodem 300	\$219.95	Prometheus Pro 1200	389.95
Smarimodem 1200	499.95	<b>Anchor Mk. 7 1200</b>	<b>\$ 309.95</b>
Micromodem IIe w/s	249.95	Anchor Volks 300	69.95
PERIPHERAL CARDS		<b>Gemini Radix 15</b>	
ALS		Accelocator II	\$429.95
Z80 CP/M 2.2	\$124.95	Neptune 64k + 80	199.95
Z80 CP/M 3.0 B1	289.95	Neptune 128k + 80	299.95
East Side		Neptune 192k + 80	379.95
<b>Wildcard II</b>		<b>Toshiba P1340</b>	
Koala Graphic Pad	84.95	Synetix	
Microsoft		Flashcard 144kb	309.95
Z80 CP/M Softcard	229.95	Flashcard 288kb	449.95
Premium Pack II +	459.95	Sprite I	119.95
Premium Pack IIe	339.95	Sprite II	199.95
Titan		Supersprite	309.95
128k Ram	174.95	Videx	
64k Ram	264.95	Videoterm w/SS	229.95
32k Ram	354.95	Ultraterm	279.95
<b>GRAPHIC INTERFACES &amp; BUFFERS</b>		<b>Tristar 315 Color</b>	
Grappler +	\$1359.5	Quadram 8k Fazer	\$1399.95
w/16k	179.95	Quadram 16k Fazer	159.95
w/32k	194.95	Quadram 32k Fazer	179.95
w/64k	229.95	Quadram 64k Fazer	194.95
PKASO/U	1359.5	Quadram 128k Fazer	274.95
<b>Print-It</b>		<b>Star Powertype</b>	
	<b>169.95</b>	Fingerprint	<b>119.95</b>
HARD DISKS		<b>Flight Simulator II</b>	
Corvus 6mB	\$1599.95	Corvus 20mB	<b>\$ 2939.95</b>
Corvus 11mB	2199.95	Franklin 10mB	1599.95
FREE SHIPPING		ORDERS ONLY: <b>800-845-3003</b>	
BUSINESS COMPUTERS OF PETERBOROUGH		QUESTIONS: 603-924-9406	
12 School Street • Peterborough, NH 03458		MasterCard	
VISA			



BUSINESS COMPUTERS  
OF PETERBOROUGH

FREE  
SHIPPING



May 1984 Cider 37

Demarest



**P**arlez-vous français? Well, our son Jerry hoped to, so he signed up for his first French course this year, and needed an easy way to practice the vocabulary. So we created Flashcards to make the practice fun and also to keep score.

The program we created has three parts. FLASHCARDS presents word pairs in random order, keeps score and gives a second practice try after a miss. After a correct response, it beeps and offers a word of encouragement (the *hurray* words). LIST MAKER enables you to enter a list of word pairs, check them and save them. LIST EDITOR allows you to review a word list and make modifications. You can create a series of standard lists and save them as LST1, LST2, ... LST100, for example, then refer to them by number to save time in reading them in.

FLASHCARDS asks whether you want one of the up-to-100 standard lists or a list you have entered. After you specify the list, the computer reads

the text file and presents the words in random order. When you respond, the program beeps twice for a correct answer and displays a hurray word. An error brings one beep, the correct answer, and a chance to type the correct word to reinforce the correction. After each word pair, the score (number correct out of number presented) is displayed. After the entire set of words, you will see the final score and percent correct.

LIST MAKER is straightforward: You type the English word in the first column, press return, and type the French word in the second column. A "blank stripper" routine removes trailing blanks after an entered word. Excess blanks in the middle of a word (for example, *la maison* instead of *la maison*) are not stripped, so be careful. After you have entered the list, the program steps through it asking for confirmation that each pair is correct. If so, enter Y; otherwise, enter any other letter to be prompted for the cor-

rection.

The neatest way we have found to distinguish between the familiar and formal *you* (*tu* vs. *vous*) or masculine and feminine *they* (*ils* vs. *elles*) is to add (f.) for *familiar* or *feminine* to the English word. Accents are not possible with the standard American character set on the Apple, so you may need conventions for them as well. We place the acute accent (|), grave accent (`), cedilla (\$) and circumflex (^) immediately after the letter being accented.

As mentioned, standard lists can be saved as LST1, LST2, and so on, and then called up simply by asking for the appropriate number in FLASHCARDS. If you have special lists, you can give them their own names, and enter a 0, return, "filename" to read them into the computer.

Although the program will accept

Address correspondence to Peter A. Lachenbruch and Jerry P. Lachenbruch at 1939 Calvin Ave., Iowa City, IA 52240.

# Flashcards

---

Studying French? Learn the vocabulary by flipping these CRT flashcards.

---

by Peter A. Lachenbruch and  
Jerry P. Lachenbruch

---

lists of up to 50 word pairs, 20 or 30 is a practical maximum. We have set up special practice lists that are 30 word pairs long, for studying conjugations of some verbs, but a list of unrelated words that long would be tough for beginners.

One problem with flashcard practice is that no two languages have a one-to-one relationship between words. For example, the French word *à* can have many meanings depending on the context (to, by, and so on). The program, meanwhile, requires a single meaning for each word. It would be possible to allow for multiple acceptable answers, but this would increase the complexity of the program considerably.

LIST EDITOR is a subset of LIST MAKER that enables you to read in a file and make modifications without re-entering the entire list. With this subprogram, you verify the correctness of each word pair, changing the words you find incorrect. ■

*Program listing, FLASHCARDS, including List Maker and List Editor.*

```
1 REM
FRENCH FLASHCARDS PROGRAM
2 REM
BY PETER A. LACHENBRUCH. COPYRIGHT JUNE1983
5 DIM CN$(10),EF$(2,50),A(50):D$ = CHR$(4):G$ = CHR$(7): REM
SET UP HURRAY ARRAY (CN), VOCABULARY (EF), PERMUTATION LIST (A)
10 HOME : VTAB 6: PRINT "YOU MAY CHOOSE: ": PRINT TAB(5); "1. PRACTICE FLASHCARDS": PRINT TAB(5); "2. MAKE A LIST OF YOUR OWN": PRINT TAB(5); "3. EDIT AN OLD LIST": PRINT TAB(5); "4. QUIT"
20 VTAB 15: CALL - 958: INPUT "YOUR CHOICE: ";CH: IF INT(CH) < > CH OR CH < 1 OR CH > 4 THEN VTAB 21: PRINT G$: "ENTER AN INTEGER BETWEEN 1 AND 4": GOSUB 5000: GOTO 20
30 ON CH GOSUB 1000,2000,3000,4000
40 GOTO 10
1000 REM
FLASHCARD DRILL SUBPROGRAM
```

*Listing continued.*

# THE COMPLETE FULL SCREEN APPLESOFT EDITOR

# EDX/AB

global search

global replace

line copy

line move

line delete

text insert

text delete

complete renumber

partial renumber

hex-dec convert

dec-hex convert

cross reference list

variable list

forward scrolling

reverse scrolling

**EDX/AB v2.0 \$69.95**

Contact your dealer or order direct.  
(Visa and Master Charge orders accepted)

Please add \$2.50 for shipping and handling.

EDX/AB™ is designed to work with  
APPLESOFT and ProDOS.\*

Please specify APPLE // or APPLE //e.

**TROY SOFTWARE  
DESIGN INC.**

63 Roseview Avenue  
Richmond Hill, Ontario

Canada L4C 1C6

(416) 884-4527



ProDOS requires 64 K RAM and APPLESOFT in ROM.

APPLE and ProDOS are registered trademarks  
of APPLE Computers Inc.*Listing continued.*

```

1020 DATA      "BRAVO!","HURRAY!","GREAT!!","WOW ! !
               !","NEAT NEAT NEAT","SWELL ! ","TERRIFIC ! ","CHIS
               MO ! ","ATTA WAY BABE ! ","SUPER MAN!": REM

HURRAY WORDS

```

```

1030 FOR I = 1 TO 10: READ CN$(I): NEXT
1040 HOME : VTAB 6: PRINT "WHICH LIST DO YOU WANT?": PRINT
               : PRINT TAB( 10);". MY OWN LIST": PRINT TAB( 1
               0);". - 100. A STANDARD LIST": REM

```

CHOOSE LISTS

```

1050 FIS = "":FLS = ""
1060 VTAB 10: PRINT : INPUT "YOUR CHOICE: ";N: IF N <
               0 OR N > 100 OR N < > INT (N) THEN PRINT G$;"E
               NTER A NUMBER BETWEEN 0 AND 100": GOSUB 5000: VTAB
               10: CALL - 958: GOTO 1060
1070 PRINT : IF N = 0 THEN INPUT "ENTER NAME OF YOUR
               LIST: ";FIS: PRINT D$;"OPEN";FIS: PRINT D$;"READ
               ";FIS: INPUT NP: FOR I = 1 TO 2: FOR J = 1 TO NP:
               INPUT EF$(I,J): NEXT : NEXT : PRINT D$;"CLOSE";F
               IS: GOTO 1090: REM

```

READ OWN LIST

```

1080 FLS = "LST" + STR$(N): PRINT D$;"OPEN";FLS: PRINT
               D$;"READ ";FLS: INPUT NP: FOR I = 1 TO 2: FOR J =
               1 TO NP: INPUT EF$(I,J): NEXT : NEXT : PRINT D$;""
               CLOSE";FLS: REM

```

READ A STANDARD LIST

```

1090 SC = 0: HOME : VTAB 6: PRINT "DO YOU WANT TO TRAN
               SLATE": PRINT TAB( 10);". ENGLISH TO FRENCH": PRINT
               TAB( 10);".2. FRENCH TO ENGLISH": PRINT
1100 INPUT "YOUR CHOICE: ";IC: IF IC < > INT (IC) OR
               IC < 1 OR IC > 2 THEN PRINT G$;"ENTER 1 OR 2": GOSUB
               5000: GOTO 1090: REM

```

CHOOSE DIRECTION OF TRANSLATION

```

1110 M = NP:IT = 3 - IC: GOSUB 1210: FOR I = 1 TO NP: HOME
               : VTAB 6: PRINT "NUMBER CORRECT= ";SC; SPC( 5);"O
               UT OF ";I - 1:JJ = A(I):TR = 0: REM

```

RUNNING SCORE

```

1120 VTAB 8: CALL - 958: PRINT "WORD: ";EF$(IC,JJ): PRINT
               : INPUT "TRANSLATION: ";TRS: GOSUB 1190: IF TR$ =
               EF$(IT,JJ) THEN GOSUB 1180:SC = SC + 1 - TR: GOTO
               1140: REM

```

PRESENT WORD AND GET ANSWER

```

1130 PRINT : PRINT G$;"SORRY, THE ANSWER IS ";EF$(IT,
               JJ): GOSUB 5000: IF TR = 0 THEN TR = 1: GOTO 1120
               : REM

```

ERROR, NOW PRACTICE THE WORD

```

1140 NEXT
1150 PRINT : PRINT "FINAL SCORE ";SC;" OUT OF ";NP: PRINT
               : PRINT INT ((SC / NP) * 1000 + .5) / 10;" PER C
               ENT": PRINT : PRINT "FILE NAME ";FIS + FLS
1160 INPUT "DO YOU WANT TO CONTINUE (Y/N)? ";YS: IF LEFT$(YS,1)
               = "Y" THEN 1040
1170 RETURN
1180 J = INT ( RND (1) * 10 ) + 1: VTAB 15: PRINT TAB(
               10);CN$(J);G$;G$: FOR IL = 1 TO 1000: NEXT : RETURN
               : REM

```

RANDOM HURRAY WORD

```

1190 IF RIGHTS (TRS,1) = " " THEN TR$ = MID$ (TRS,1
               , LEN (TRS) - 1): GOTO 1190: REM

```

REMOVE ANY BLANKS FROM RIGHT OF WORD

```

1200 RETURN
1210 FOR I = 1 TO M:A(I) = I: NEXT :M1 = M:M2 = M1 -
               M + 1
1220 FOR J = M1 TO M2 STEP - 1:AB = INT ( RND (1) *
               J) + 1:TM = A(J):A(J) = A(AB):A(AB) = TM: NEXT : RETURN : REM

```

GET A RANDOM PERMUTATION OF WORDS

2000 REM

*Listing continued.*

***Listing continued.***

```

LIST MAKER SEGMENT

2010 HOME : VTAB 6: PRINT "THIS PROGRAM MAKES LISTS O
F PAIRS ": PRINT : PRINT "OF WORDS. THE NUMBER O
F PAIRS MUST ": PRINT : PRINT "LESS THAN OR EQUAL
TO 50"
2015 VTAB 12: CALL - 958: INPUT "HOW MANY PAIRS? ";N
P: IF NP > 50 THEN VTAB 21: PRINT G$;"THE NUMBER
OF PAIRS IS TOO LARGE": GOSUB 5000: GOTO 2015
2020 HOME : VTAB 5: PRINT "ENGLISH"; TAB( 20); "FRENCH
": PRINT
2030 POKE 34,6: POKE 35,21: REM

SET TOP AND BOTTOM OF SCREEN

2040 FOR I = 1 TO NP: VY = PEEK (37) + 1: IF VY > 20 THEN
VTAB 7: VY = 7: HTAB 1: CALL - 958
2050 PRINT I; ". ":"; INPUT EF$(1,I): VTAB VY: HTAB 20:
INPUT EF$(2,I): NEXT
2060 POKE 34,5: HOME : VTAB 3: VTAB 6
2070 FOR I = 1 TO NP: PRINT I; ". ":"; EF$(1,I); TAB( 20)
;EF$(2,I): PRINT : REM

PRINT WORD PAIRS

2080 INPUT "IF CORRECT ENTER Y: ";Y$: IF LEFT$(Y$,1
) = "Y" THEN 2100
2090 INPUT "ENGLISH: ";EF$(1,I): INPUT "FRENCH: ";EF$
(2,I): GOTO 2080: REM

MAKE CHANGES

2100 NEXT
2110 INPUT "ENTER LIST NAME: ";FI$: PRINT DS; "OPEN"; F
I$: PRINT DS; "DELETE"; FI$
2120 PRINT DS; "OPEN ";FI$: PRINT DS; "WRITE"; FI$: PRINT
NP: FOR I = 1 TO 2: FOR J = 1 TO NP: PRINT EF$(I,
J): NEXT : NEXT : PRINT DS; "CLOSE ";FI$: POKE 34,
0: POKE 35,24: REM

WRITES # WORDS AND WORD LIST

2130 INPUT "DO YOU WANT TO MAKE ANOTHER LIST? ";Y$: IF
LEFT$(Y$,1) = "Y" THEN 2010
2140 RETURN
3000 REM

LIST EDITOR - ALLOWS YOU TO CHANGE AN EXISTING LIST
WITHOUT COMPLETELY RE-ENTERING IT

3020 HOME : VTAB 6: PRINT "THIS PROGRAM ALLOWS YOU TO
EDIT AN": PRINT : PRINT "EXISTING FLASHCARD FILE
"

3030 PRINT : INPUT "ENTER THE FILE NAME: ";FI$
3040 PRINT DS; "OPEN ";FI$: PRINT DS; "READ"; FI$: INPUT
NP: FOR I = 1 TO 2: FOR J = 1 TO NP: INPUT EF$(I,
J): NEXT : NEXT : PRINT DS; "CLOSE ";FI$
3050 PRINT "ENGLISH": TAB( 20); "FRENCH"
3060 FOR J = 1 TO NP
3070 PRINT EF$(1,J); TAB( 20); EF$(2,J): INPUT "TYPE Y
IF OK: ";Y$: IF LEFT$(Y$,1) < > "Y" THEN GOSUB
3130: GOTO 3070
3080 W$ = EF$(1,J): GOSUB 3140: EF$(1,J) = W$: W$ = EF$(2,J): GOSUB 3140: EF$(2,J) = W$: NEXT : REM

STRIP BLANKS OFF RIGHT

3090 INPUT "SAME FILE NAME (Y/N)? ";Y$: IF LEFT$(Y$,
1) < > "Y" THEN INPUT "ENTER NEW FILE NAME: ";
FI$
3100 PRINT DS; "OPEN"; FI$: PRINT DS; "DELETE"; FI$: PRINT
DS; "OPEN ";FI$: PRINT DS; "WRITE"; FI$: PRINT NP: FOR
I = 1 TO 2: FOR J = 1 TO NP: PRINT EF$(I,J): NEXT
: NEXT : PRINT DS; "CLOSE ";FI$
3110 INPUT "MORE EDITING (Y/N)? ";Y$: IF LEFT$(Y$,1
) = "Y" THEN 3020
3120 RETURN
3130 INPUT "ENGLISH: ";EF$(1,J): INPUT " FRENCH: ";E
F$(2,J): RETURN
3140 IF RIGHTS$(W$,1) = " " THEN W$ = MID$(W$,1, LEN
(W$) - 1): GOTO 3140
3160 RETURN : REM

LINES 3140 TO 3160 ARE THE BLANK STRIPPER

4000 HOME : VTAB 6: PRINT "THANKS FOR TRYING THIS PRO
GRAM, ": PRINT : PRINT "KEEP PRACTICING AND IT WI
LL GET EASIER": END
5000 VTAB 24: PRINT "PRESS <<SPACE>> TO CONTINUE": GET
A$: VTAB 20: HTAB 1: CALL - 958: RETURN

```

**Innovation**

State-of-the-Art products, such as UltraTerm® our 128-column display card, providing more of what you need when you need it.

**Quality**

Each Videx Product is fully tested, TWICE, before it ever reaches your computer. That's why Videoterm has the best track record in the business.

**Support**

Ask your Dealers and friends! Quick, Competent help, just a phone call away, has made Videx the recognized leader in customer support.

**Excellence**

Videx...It all adds up...for YOU!

You can't buy better products to enhance the power and ease-of-use of your personal computer.



For More Information Call us at  
(503) 758-0521  
1105 N.E. CIRCLE BLVD  
CORVALLIS, OR 97330

# Hunting the Elusive ASCII

Join us on an adventure into the deepest recesses of screen coding! Are you intrepid enough to discover the true nature of ASCII?

---

by Arsen Darnay

---

Some of us are cursed with the need to know how things work. From time to time we snag on some detail and can't rest until we've tracked the answer to its lair. I've just come back from such a safari. Been hunting ASCII. And here's my trip report.

#### ASCII in General

What's so elusive about ASCII? Most people know that the abbreviation stands for American Standard Code for Information Interchange. Computers handle only numbers; letters must be turned into numbers to be recognized. ASCII is the convention for assigning numerical values to typographical symbols. The whole business is rather straightforward—or so it

seems. I became intrigued when I noticed that two different ASCII codes produce the same result.

Take the letter 'A,' for instance. The commands PRINT CHR\$(65) and PRINT CHR\$(193) will both produce an A on screen. But if you compare them to one another, they behave like different letters. Type CHR\$(65)=CHR\$(193) and press return. Apple will return a zero. It thinks that the statement is *false*. Your eyes show you the same letter A. I wondered what was going on, and that was my point of departure.

So let's take a closer look at ASCII. The standard code assigns the values from 0–127 to 128 control characters and typographical symbols (see Fig. 1). If you place one of these values into

the CHR\$(X) command in Basic you will see the corresponding symbol on-screen. Yet Apple also permits you to use a higher set of numbers—from 128 to 255. Thus, ASCII 7 and 135 will both produce the bell. Both return control-G, in other words. The difference between them must be on the level of bits and bytes.

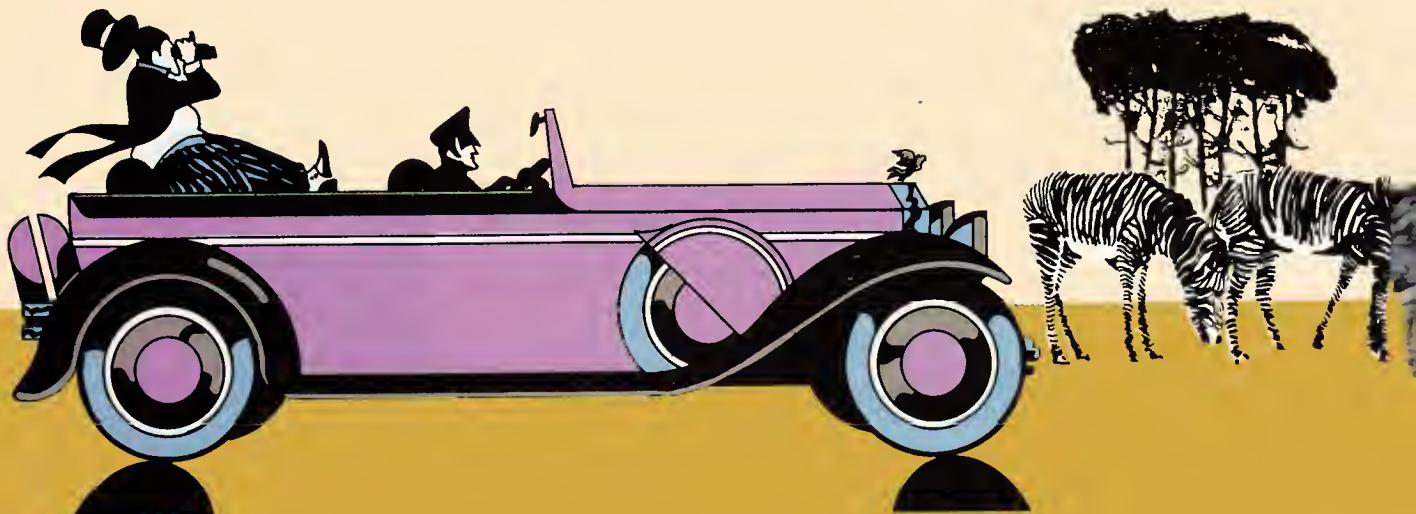
If you look at the number 127, you will discover that it's the highest value that the first seven bits of a byte can produce:

Bit Number	8	7	6	5	4	3	2	1
Bit Value	0	64	+ 32	+ 16	+ 8	+ 4	+ 2	+ 1

Add up the values shown, and you

---

Write to Arsen J. Darnay at 23 W. St. Albans Road, Hopkins, MN 55343.



have 127 or, in binary notation, 01111111. The conventional ASCII notation, in other words, uses only the first seven bits of a byte; it leaves the eighth or highest bit free.

Now let's compare the two kinds of A that Apple recognizes. At the level of a byte, the situation looks like this:

ASCII 65	01000001
ASCII 193	11000001

The two values are identical in all ways but one. In the ASCII 193 version, *the high bit is set*. The high bit is worth 128 ( $64 \times 2$ ), and  $65 + 128 = 193$ .

As you noodle around with these two representations of A inside the Apple, you'll discover that Basic holds letters in lower ASCII (0-127), whereas the Apple itself, for purposes of display, converts the values to higher ASCII (128-255). Enter the following program:

```

100 HOME
120 FOR I=0 TO 127
130 PRINT CHR$(I);
140 NEXT

```

What you will get when you run this program will depend on your Apple or how it is equipped. 'Out of the crate' Apple II's and II Pluses will not produce the lowercase letters nor certain other symbols on-screen. The IIe will. In place of the lowercase letters, the II and II Plus will start over again with the space, !, ", and # sequence. The control characters won't show up, although you'll hear control-G (ASCII 7) beeping.

If you modify line 120 in this exam-

*Figure 1. Standard ASCII character codes.*

STANDARD ASCII CHARACTER CODES

Decimal	Hex	Key	Tradit. Name(1)	Function
0	\$00	CTRL-@	NULL	
1	\$01	CTRL-A	SOH	
2	\$02	CTRL-B	STX	
3	\$03	CTRL-C	ETX	Stop Running Program
4	\$04	CTRL-D	ET	DOS Flag
5	\$05	CTRL-E	ENQ	
6	\$06	CTRL-F	ACK	
7	\$07	CTRL-G	BEL	Bell
8	\$08	CTRL-H	BS	Backspace, Left Arrow
9	\$09	CTRL-I	HT	Tab
10	\$0A	CTRL-J	LF	Linefeed, Down Arrow (IIe)
11	\$0B	CTRL-K	VT	Up Arrow (IIe)
12	\$0C	CTRL-L	FF	Form Feed
13	\$0D	CTRL-M	CR	RETURN
14	\$0E	CTRL-N	SO	
15	\$0F	CTRL-O	SI	
16	\$10	CTRL-P	DLE	
17	\$11	CTRL-Q	DC1	
18	\$12	CTRL-R	DC2	
19	\$13	CTRL-S	DC3	Stop listing program
20	\$14	CTRL-T	DC4	
21	\$15	CTRL-U	NAK	
22	\$16	CTRL-V	SYN	
23	\$17	CTRL-W	ETB	
24	\$18	CTRL-X	CAN	Cancel Line
25	\$19	CTRL-Y	EM	
26	\$1A	CTRL-Z	SUB	
27	\$1B	ESC	ESC	
28	\$1C	None	FS	
29	\$1D	None	GS	
30	\$1E	None	RS	
31	\$1F	None	US	
32	\$20	SPACE		
33	\$21	!		
34	\$22	"		
35	\$23	#		
36	\$24	\$		
37	\$25	%		
38	\$26	&		
39	\$27	/		
40	\$28	<		

(1) As used in Telecommunications.

*Figure continued.*



*Figure continued.*

Decimal	Hexadecimal	Key	Decimal	Hexadecimal	Key
41	\$29	)	85	\$55	U
42	\$2A	*	86	\$56	V
43	\$2B	+	87	\$57	W
44	\$2C	.	88	\$58	X
45	\$2D	-	89	\$59	Y
46	\$2E	.	90	\$5A	Z
47	\$2F	/	91	\$5B	[
48	\$30	0	92	\$5C	\
49	\$31	1	93	\$5D	]
50	\$32	2	94	\$5E	^
51	\$33	3	95	\$5F	_
52	\$34	4	96	\$60	space(2)
53	\$35	5	97	\$61	a
54	\$36	6	98	\$62	b
55	\$37	7	99	\$63	c
56	\$38	8	100	\$64	d
57	\$39	9	101	\$65	e
58	\$3A	:	102	\$66	f
59	\$3B	;	103	\$67	g
60	\$3C	<	104	\$68	h
61	\$3D	=	105	\$69	i
62	\$3E	>	106	\$6A	j
63	\$3F	?	107	\$6B	k
64	\$40	~	108	\$6C	l
65	\$41	A	109	\$6D	m
66	\$42	B	110	\$6E	n
67	\$43	C	111	\$6F	o
68	\$44	D	112	\$70	p
69	\$45	E	113	\$71	q
70	\$46	F	114	\$72	r
71	\$47	G	115	\$73	s
72	\$48	H	116	\$74	t
73	\$49	I	117	\$75	u
74	\$4A	J	118	\$76	v
75	\$4B	K	119	\$77	w

*Figure continued.*

ple to read FOR I = 128 TO 255, you'll get the same result. The Apple treats the ASCII values, plus 128, the same way as it treats the ASCII values themselves.

Modify these programs so that they will print to your printer, and you will notice that this time even the Apple II and II Plus are producing lowercase letters. These models of the Apple don't have lowercase *fonts*, but your printer does. And with that we'll have to go a little deeper into the jungle.

#### Fonts

Why Apple uses 'higher' ASCII for its internal purposes is linked to its modes of forming letters for presentation on the screen.

The image on the screen is generated directly by hardware. The Apple sends a stream of bits to the video output; the bits are displayed on the screen. Those set to 0 are blank; those

Circle 373 on Reader Service card.

## INCREASE MICROCOMPUTER EFFICIENCY

IntroVoice allows you to speak to your microcomputer and increase your efficiency. IntroVoice runs any application program on the Apple II® series or Franklin® computer and features:

- Reduces Data Entry Errors
- Reduces Application Software Training
- No Typing Skills Required
- Combination Voice And Keyboard
- Operates When Hands Or Eyes Are Busy

FOR ADDITIONAL INFORMATION CALL OR WRITE:

**Voice  
Machine  
Communications**

1000 South Grand Avenue, Santa Ana, CA 92705

Telephone:

In California - 714-541-0454 Or Outside California - 1-800-821-2226



**IntroVoice**  
**The Voice Connection**

® Trademark

MasterCard and Visa Accepted

*Figure continued.*

76	\$4C	L	120	\$78	x
77	\$4D	M	121	\$79	y
78	\$4E	N	122	\$7A	z
79	\$4F	O	123	\$7B	c
80	\$50	P	124	\$7C	i
81	\$51	Q	125	\$7D	)
82	\$52	R	126	\$7E	~
83	\$53	S	127	\$7F	Delete
84	\$54	T			

(2) On the IIe, this produces a left-leaning single quote (`).

set to 1 show up as tiny dots. A blank screen means that all bits sent to the screen are zero. The signal is sent to the screen of 280 dots across and 192 lines of dots from top to bottom. That  $280 \times 192$  matrix is probably familiar to you from high-resolution graphics.

How does Apple know *what* bits to send to the screen? It looks in specific areas of memory such as the text page, which consists of 1,024 locations (from 1024 to 2047—that coincidence of page length and starting address is just that, coincidence). Of these locations, only 960 are used for display. The number comes from 40 columns times 24 lines. For every on-screen spot, memory holds one byte. It's by reading this byte that Apple knows what to display.

Each position on the screen is made up of 56 dots: 280 divided by 40 yields 7, 192 divided by 24 yields 8, and 7 times 8 is 56. Thus, each character on

screen (and the spaces that separate it from other characters) must be shown by 56 separate bits. However, one byte holds only eight bits! How can *one* byte in the Text Page memory produce 56 bits on screen? Here is where character fonts come into play.

Fonts in the Apple are groupings of bytes in read-only memory. One group of eight bytes makes up a letter. The best way to illustrate this is with a picture of the letter A encoded in bytes.

Do you see the shape of the A? The character 'block' consists of eight lines and seven columns. The letter itself is within a  $5 \times 7$  matrix, leaving room on both sides and the top so that the letters won't 'fuse' into each other.

0000000	byte value:	0
0001000		8
0010100		20
0100010		34
0100010		34
0111110		62
0100010		34
0100010		34

Since each pattern requires eight bytes and seven bits per byte, Apple must find eight bytes stored somewhere in memory to display a letter. If the lowercase 'a' is not stored somewhere, it cannot be produced. On the II and II Plus (unless modified), the following pattern is not in memory and hence won't show on-screen:

Circle 162 on Reader Service card.

Circle 139 on Reader Service card.

## Bible Mountain

A fun and exciting Bible educational game!

Our No. 1 seller is now better than ever! VERSION 3.0 now supports multiple choice questions, has improved Hi-Res graphics and sound, and more!

- For 2 to 20 players
- 60 question/answer set included
- gives correct answers and scriptural reference when a question is missed
- easily create, add, and edit your own question/answer sets

For Apple II+, IIe\*

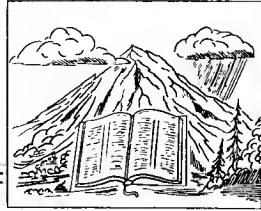
48k WITH DISK DRIVE

**\$25.00**

Add \$1.50 Shipping Plus Handling

Order now and get the free game  
"BIBLETRATION!"

DEALER INQUIRIES INVITED



**J & M SOFTWARE** Dept. C

P.O. Box 2132  
Athens, Texas 75751  
(214) 675-8479

Disks are not locked

\*APPLE is a registered trademark of Apple Computer, Inc.

## PORTFOLIO

"From beginning to end, it gleams with quality"

SOFTALK, December 1983

Every now and then, a program comes along that 'does it all.' Take the one that IBM® owners are so proud of. You know, the program they paid \$500 for.

Well now, there's this new program called PORTFOLIO, designed for the Apple® computer. It's so revolutionary, we don't even know what to call it.

"Simulation doesn't begin to do this one justice. Calling it a game is an insult. Educational? Too dry. Part of a new era of software spanning all of the above? Even that doesn't go far enough."

— SOFTWARE REVIEW  
February 1984

Apple owners, go ask your local dealer about PORTFOLIO. Dealers, if you haven't seen PORTFOLIO, it's about time you did.

**FLEXIBLE SOFTWARE** 804.979-0973  
134-10 Ivy Drive, Charlottesville, Virginia 22901

0000000  
0000000  
0000000  
0011000  
0000100  
0011100  
0100100  
0011010

On the Apple IIe the pattern is in memory and hence shows. (Trace over this pattern with a pen, and the shape will emerge.) Here is how a character appears on-screen:

- (1) Apple scans through the text page memory;
- (2) it interprets the one-byte values it finds there;
- (3) it fetches eight bytes from ROM for every screen position;
- (4) it sends them to the video output in a stream of bits;
- (5) characters appear on-screen; and
- (6) the process starts all over again.

This happens many times each second; each time,  $280 \times 192$  or 53,760 bits rush to the screen, each bit either on or off. The Apple's character gener-

ator, in effect, performs much like a plotting program. It places bright or dark dots on-screen based on codes stored in the text area of memory.

Let's say that the letter A is typed as the first character on top of the screen. The first location of the text memory will hold the one-byte value of 193 (\$C1 in hexadecimal). Why the value is 193 rather than 65 will emerge by-and-by. Suffice it to say here that that code, 193, will generate signals held in *eight* bytes of a character font. Those values will be 0, 8, 20, 34, 34, 62, 34, and 34. Those signals will produce a block of dots, some off, some on, forming a  $7 \times 8$  matrix at the extreme upper left hand of the screen. One byte of text page memory triggers the automatic display of *eight* bytes of display.

#### Text Versus Graphics

If text is printed to a screen that is

```

100 REM HI RES A'S
102 :
104 REM DEMONSTRATES HOW TO
106 REM MAKE A SMALL LETTER
108 REM ON THE HIGH RES
110 REM SCREEN.
112 :
200 HGR
210 P = 8192
220 FOR K = 1 TO 2
240 FOR I = 0 TO 7168 STEP 1024
250 READ N
260 POKE P + I, N
270 NEXT I
280 P = P + 1
290 NEXT K
300 RESTORE
310 IF P < 8192 + 40 THEN 220
320 END
330 :
340 DATA 0,0,0,12,16,28,18,44
350 DATA 0,8,20,34,34,62,34,34
360 :
370 REM 8192 IS START OF
380 REM THE HI-RES SCREEN.
390 REM EACH LINE OF DOTS
400 REM FORMING A LETTER
410 REM IS 8192 + 1024
420 REM MEMORY LOCATIONS
430 REM APART.
440 REM
450 REM IN LINE 280, 8192
460 REM IS INCREMENTED SO
470 REM THAT THE NEXT
480 REM CHARACTER CAN BE
490 REM PRINTED. THIS IS
500 REM DONE 40 TIMES FOR
510 REM ONE LINE OF
520 REM LETTERS.
530 REM
540 REM DATA IN LINE 340
550 REM MAKE THE SMALL
560 REM A. LINE 350 FORMS
570 REM THE CAPITAL A.
580 REM THE LETTERS MUST BE
590 REM 'BACKWARDS' TO COME
600 REM OUT RIGHT!!

```

*Program listing, HI RES A's.*

Circle 404 on Reader Service card.

## SAVE BIG ON COMPUTER PRODUCTS

### MODEMS

HAYES

Smartmodem 300	209
Smartmodem 1200	489
Smartmodem 1200B	425
Micromodem II E	240
Smartcom II Software (for IBM PC)	90
NOTATION	
J. Car 2008 direct	99
103 Smart 300B Smart	159
103/12 Smart 300/1200 8	379
AppleCat II 300 board for Apple	200
212 AppleCat 300/12008 for Apple	390
Access 1-2-3 12008 for IBM	379

### MONITORS

GORILLA

12" Green	88.00
12" Amber	94.00
TAXAN	
12" KG-12N (green)	120
12" KG-12N UY (amber)	125
RGB vision III	499

AMOEK

V300G 12"	green	130
V300A 12" amber	145	
V310A 12" amber (for IBM)	160	
Color I+ 13" composite	280	
Color II 13" RGB	225	
Color IV 13" RGB analog	240	
Monitor Cables		
PA 400 for TI-99/4A or Commodore	15	

### QUADRAM

MICROFAZER

GRMPS-8 Par/Par	135
GRMSP-8 Ser/Par	145
GRMSS-8 Ser/Ser	145
GRMPS-8 Par/Ser	145
QUADBOARD (for IBM PC)	
GR5064 64K	270
GR4064 64K	270
QUADLINK	
GR 3000 for IBM	475
GR 3010 for Compaq	475
GR 3020 for Columbia	475
GR 8201 Quedcolor-1	200
GR 8202 Quedcolor-2 (upgrade kit)	200
e Ram 80 - 80 col. card for Apple IIe	115



### HEWLETT-PACKARD CALCULATORS

HP-11C	70	HP-15C	60
HP-12C	90	HP-16C	90
HP-41C	145	HP-41CX	245
HP-41CV	200	HP-97	560

all software & accessories too

PORTABLE COMPUTERS	
HP-71B	399

HP-75

719



### CABLES — INTERFACES

accessories for Computer Printers

GRAPPLER PLUS	120
16K BUFFERED GRAPPLER	165
Apple Dumpling	70
Cardco G	65
10 ft. Per. Cable for IBM	32
10 ft. 36x36 Parallel	32
10 ft. 25x36 Parallel	25
Y Cable (for TI-99/4A)	25
6 ft. TI-99/4A parallel cable	25

13x16 printer stand (for 80 col. printers)

16x22 printer stand (heavy duty) (for wide carriage printers)

14x11 green bar, 20 lb.

14x11 green bar, 20 lb.

Ribbon Cartridges

for Epson 80 col.

for Epson 132 col.

for Mann. Tally 160

for Mann. Tally 180

for M.T. Sprint 80

for Panasonic 1090

for Qidate 80, 82, 83

for C. Itoh Standard

Two spool ribbons

for Gemini 10/10, 15/15X,

Okidate 80, 82, 83

6 for 15 00 or 12 for 24 00

### RIBBONS, PAPER

Paper — 1000 Sheet Pack

9½ x 11 white, 20 lb.

9½ x 11 green bar, 20 lb.

9½ x 11 trim edge, 20 lb.

14 x 11 green bar, 20 lb.

Ribbon Cartridges

for Epson 80 col.

for Epson 132 col.

for Mann. Tally 160

for Mann. Tally 180

for M.T. Sprint 80

for Panasonic 1090

for Qidate 80, 82, 83

for C. Itoh Standard

Two spool ribbons

for Gemini 10/10, 15/15X,

Okidate 80, 82, 83

6 for 15 00 or 12 for 24 00

### CALL TOLL FREE 800-621-1269 EXCEPT Illinois, Alaska, Hawaii

Corp. Accts. Invited. Min. Ord. \$15.00. Mastercard or Visa by mail or phone. Mail Cashier's Check, Mon. Ord., Pers. Check (2 wks. to clear) Add \$4.00 1st item. (AK, HI, P.R., Canada add \$10.00 first item) \$100 ea. add'l shpg. & handling. Shipments to U.S. address add 7% tax. Prices subject to change. WRITE for free catalog. RETURN POLICY: Defective Only: Most products replaced within 30 days of purchase with identical merchandise only. Computer and large peripherals replaced only when defective or otherwise within 3 weeks of purchase. Other problems covered by mfr. warranty. ALL ELEK-TEK MERCHANDISE IS BRAND NEW. FULL SATISFACTION GUARANTEED.

ELEK-TEK, inc.

6557 N. Lincoln Ave., Chicago, IL 60645  
(312) 631-7800 (312) 677-7680

organized exactly like the high-resolution graphics output, why can't we write on the hi-res page or, conversely, plot on the text page? The high resolution page is 'bit mapped,' whereas the text mode is not. In the hi-res mode, eight times more memory locations must be programmed to create a screenful of display than in the text mode. In text, you put one value into memory (the ASCII code number—by hitting a key or otherwise) and eight bytes come back automatically. In hi-res, the same result will require putting eight values into memory first. You can write letters on the hi-res page if you care to code them in, eight dot-lines per letter.

In hi-res, one byte of memory controls seven dots on the screen. (The eighth bit is not shown; it's used to code for color.) One dot-line across the screen is 280 dots wide;  $280 \div 7 = 40$ ; 40 bytes are required for one very narrow part of the screen. We have 192 dot-lines to plot. So  $40 \times 192$  or 7,680 bytes are needed to paint a graphics

screen. That compares with 960 bytes for a screen of words. (The block of memory dedicated to a graphics page is actually 8,192 bytes long, but not all bytes are used for on-screen display.)

The program HI RES A's—see Program listing—will print a line of alternating lowercase and capital A's on your hi-res screen and might give you the impetus for some hunting of your own.

### Screen ASCII

Now that we understand the territory a little better, let's plod into the deepest part—screen ASCII.

The Apple can generate normal, inverted, and flashing characters. To produce these symbols, the computer has to have a code in the appropriate location of the text page memory. Each location is only one byte. How, then, will the Apple know whether you want normal, inverse, or flashing display? That one byte, after all, must hold this information.

Apple's designers have solved this problem by producing three special variants on the ASCII code. They use 256 values to encode *three* character codes, as follows:

- 0–63 are used for inverted characters. Bits 7 and 8 are always off (set to zero).
- 64–127 are used for flashing display. Bit 7 is always on, bit 8 is still off.
- 128–255 are for normal display. Bit 8 is always on.

The maximum value that six bits can produce is 63. This limits the number of characters that can be coded to 64–0 plus the other 63. Sixty-four 'spots' are just sufficient to produce the uppercase alphabet, the numerals, and the main typographical symbols.

The *inverse* screen code begins with the ampersand—it has the value of 0; A is 1, B is 2, and so on up to the question mark at 63. The *flashing* screen code begins at 64 with the ampersand; A is 65, B is 66, etc. The series goes to 127 (the question mark).

Notice what has happened. The conventional ASCII sequence (0–127) has been split in half. Where the control characters used to be, we now have inverted letters. The numerals and typographical marks are still

**TOP QUALITY  
APPLE COMPATIBLE**

**\$175**

Standard Height Apple Compatible ..... \$175  
High Quality Half Height Apple Compatible ..... \$185  
AP-100-A 2-in-1 ..... \$469  
AP-100-B Full Height ..... \$239  
AP-100-C Slim Line ..... \$239  
Atlas 8 Direct Drive ..... \$199

HARDWARE FOR APPLE			LIST PRICE	OUR PRICE	LIST PRICE	OUR PRICE
			MICROSOFT		OKI DATA	
Controller Card (dual)	\$ 79	\$ 45	Softcard	345	Microline 82A	\$ 549
16K Ram Card	79	42	Softcard Premium System	695	Microline 92P	699
Z-80 Card	185	69	Premium Softcard Ile	495	Gemini 10X	279
80 Column Card	229	85	Softcard Plus System	645	Gemini 15X	549
Cooling Fan w/Surge Protection and Dual Outlets	69	39	DUMPLING-GX	159	10X 4K Serial	119
Joystick	49	29	64K Ram Card	379	10X 4K Buffer	99
Computer Case Similar to II+	149	59	128K Ram Card	479	TOSNISA	
Replacement Keyboard	149	69	MUSIC SYSTEM w/Software	395	P1350 w/Parallel Interface	2,195
Case w/Numeral Keys	329	169	The Clock	280	TRANSTAR	
Switching Power Supply	110	64	GRAPPLER +	175	T315 Color Printer	599
RS 232 Card	159	69	Buffered Grappler +	239	PICS Apple Interface	119.95
Parallel Printer Card w/Cable	149	55	Bufferboard	175	120P	599
Power Strip w/Surge Protection 6 Outlets	59	23	PERSONAL COMPUTER PRODUCTS		MONITORS	
ADVANCED LOGIC SYSTEMS			Appli-Card 4MHz/64K	295	AMOEK	
Oispather	139	129	Memory	225	V300 12" Green	179
CPM Card	399	309	Appli-Card 6MHz/64K	375	V300A 12" Amber	199
Z Card II	169	139	Memory	285	Color I+	399
Smarter II	179	149	PRATICAL PERIPHERALS		Color II+	435
CALIFORNIA COMPUTER SYSTEMS			16K Micro 8 Buffer II	199	NEC	
Clock/Calendar	120	95	32K Micro Buffer II	219	JB 1260 12" Green	149.95
CORVUS			MOCKBOARD	124.95	JB 1205M (A) 12"	210
6 Meg. Disk System	2,195	1,689	Supersprite w/3 5 1/4" Diskettes	454.95	SANYO	
11 Meg. Disk System	2,995	2,289	TISSUE SYSTEMS		12" Hi Res Green	145
20 Meg. Disk System	3,995	2,995	Mockingboard	92	9" Hi Res Green	175
DAN PAYMAR/ENHANCEWARE			Supersprite w/3 5 1/4" Diskettes	319	13" Med Res Color	795
LCA-1	37.50	35	TITAN SYSTEMS		TAXAN	
LCA-2	27.50	24	32K Ram Card	219	12" Amber	190
EASTSIDE SOFTWARE			64K Ram Card	349	12" Green	180
Wildcard	109.95	89	64K Ram+80 Col.	249	RGB Vision I	399
Wildcard II	139.95	105	Accelerator II	599	RGB Vision III	499
ELECTRONIC PROTECTION DEVICES			VIOEX		MODEMS	
The Lime	89.50	72	Ultraterm	379	NAYES	
The Orange	139.95	105	Videoterm	279	Smartmodem 1200	699
ENTER COMPUTER			80 Col+ Soft Switch	309	Micromodem 11e (New)	329
Sweet-P Plotter	695	479	Enhancer II	149	Smartcom I (Apple)	119
INNOVATIVE CONCEPTS			Function Strip	79	Chronograph	249
Flip'n File	29.95	23	Visicalc Preboot	49	NOVATION	
Flip'n File 50	39.95	29	PRINTERS		CAT Acoustic 300	189
KENSINGTON MICROWARE			Call for prices on Diablo, IDS and NEC		J-CAT	149
System Saver Fan	89.95	69	BROTHER		103 Smart CAT	249
KOALA TECHNOLOGIES			HR-15P	599	103/212 Smart CAT	595
Koala Pad w/Micro Illustrator	124.95	79	HR-25P	995	212 Auto CAT	695
KRAFT			MANNESMANN TALLY		Apple CAT II	389
Joystick	64.95	49	Spintr 80	309	212 Apple CAT Upgrade Kit	389
Paddles	49.95	39	MT-160L	798	SOFTWARE	
			MT-180L	1,098	Please call for current listing	

**FREE SHIPPING** To order or for FREE catalog, phone **312-355-9726** **FREE SHIPPING**

If you don't see what you need, call us...we probably have it.

We accept check, money order, VISA or Mastercard (include # and expiration date). Please add 2% for credit card purchase. Illinois residents add 6.25% sales tax. Personal and company checks allow 2 weeks to clear. Prices subject to change without notice. Free shipping applies only to Continental U.S.



**MICRO CITY**  
P.O. Box 571 • Downers Grove, IL 60515



# Improved Again!

## Insure against disk loss with Back It Up III™

Want to make back-up copies of all that valuable software you purchased for your Apple computer? BACK IT UP III helps you do it quickly and easily. Think of it as low-cost insurance for your disk library.

BACK IT UP III enables you to copy almost every kind of "protected" disk. You'll find BACK IT UP III an invaluable addition to your library, even if you already own another nibble copy program or a "copy card." In fact, the combination of BACK IT UP III and a "copy card" is almost unbeatable!

**Standard features** that have made Back It Up II+ a best seller include: 1) automatic half-tracking; 2) preserving nibble counts; 3) synchronizing tracks; 4) Quick Scan disk previewing; 5) diskette erasing; 6) Automatic decoding of "unreadable" tracks; 7) Nibble reader for in-depth analysis of unusual disk formats; and 8) a comprehensive set of optional parameter changes allowing BACK IT UP III to copy new protection schemes as they are introduced.

**Exclusive new features** include: an automatic decode option for "4 x 4 encoded" tracks with an optional checksum-verification of the copy, an improved automatic decode option for DOS-sectorized tracks; a disk speed check that gives the same answers as Apple's dealer diagnostics, and a disk drive quality test.

**Other new advantages** include a disk certification test and the ability to automatically detect and reproduce "synchronization" bytes using an automatic "bit insertion" technique. BACK IT UP III can even convert some half-track programs for use on Micro-Sci disk drives.

BACK IT UP III is also the only nibble-copy program that gives you a comprehensive tutorial on nibble copying and protection techniques and instructions for repairing "blown" disks. Use it with Apple IIe, Apple II+ or Apple-compatible computers. Two disk drives recommended.

**Important Notice:** This product is intended SOLELY for the computerist who desires to take advantage of his legal right (under federal copyright law) to make archival copies of computer programs that he has purchased.

Protect your investment in expensive software products with the powerful one—BACK IT UP III! Available for only \$74.95 from:

### Sensible Software, Inc.

24011 Seneca  
Oak Park, MI 48237  
(313) 399-8877

Visa, Master Card, checks and COD welcome.  
Please add \$1.25 for postage and handling.

Screen Code Number	Apple II, II+	Primary Set	Apple IIe	Alternate Set
0-31	Uppercase Inverse	Uppercase Inverse	Uppercase Inverse	Uppercase Inverse
32-63	Special Inverse	Special Inverse	Special Inverse	Special Inverse
64-95	Uppercase Flash	Uppercase Flash	Uppercase Flash	Uppercase Inverse
96-127	Special Flash	Special Flash	Special Flash	Lowercase Inverse
128-159	Control Charact.	Uppercase Normal	Uppercase Normal	Uppercase Normal
160-191	Special Normal	Special Normal	Special Normal	Special Normal
192-223	Uppercase Normal	Uppercase Normal	Uppercase Normal	Uppercase Normal
224-255	Special Normal	Lowercase Normal	Lowercase Normal	Lowercase Normal

**Notes:** No lowercase at all unless specially equipped.

No lowercase Inverse or Flashing modes.

No Flash in any mode. Gives Inverse lowercase.

'Special' means typographical marks, math operators, and the numerals.

Figure 2. Screen codes for Apple II, II Plus, and IIe.

Command	Screen Memory	On Screen
PRINT CHR\$(65)	\$C1 (193)	A
PRINT CHR\$(193)	\$C1 (193)	A
INVERSE: PRINT CHR\$(65)	\$01 (1)	Inverted A
INVERSE: PRINT CHR\$(193)	\$01 (1)	Inverted A
FLASH: PRINT CHR\$(65)	\$41 (65)	Flashing A
FLASH: PRINT CHR\$(193)	\$41 (65)	Flashing A
NORMAL: PRINT "A"	\$C1 (193)	A

Figure 3. Relationships between screen code and ASCII code.

where they are in the standard code, but inverted. Where the uppercase letters should be, we now have flashing capitals; and in place of the lowercase letters we have flashing numerals and typographical symbols (see Figure 2). By sacrificing the control characters (which you don't need to see anyway) and the lowercase letters, we get two sets of symbols, inverted and flashing, out of seven bits.

The third screen code is for normal display. Here the eighth bit is always on; the range extends from 128 to 255. The control characters (128-159) generally don't appear; the visible sequence begins with the space, !, ", # series; the ampersand is 192, A is 193, B is 194, and so on. A normal A is always coded as 193 for display purposes—even if you give it to the machine as 65, as in PRINT CHR\$(65).

Keep in mind that this is *screen* code. You can't type PRINT CHR\$(1) and expect to get an inverse A (I thought I could and learned otherwise). But if you say INVERSE: PRINT CHR\$(65), the screen memory will hold a 1. Figure 3 shows the relationship.

The eight-bit limit on screen coding is the reason why no Apple displays flashing lowercase letters. The byte has no room to flag that condition.

### Inverse and Flash

How are inverse and flash created? Refer back to the diagram in the text of the A made of zeroes and ones, and imagine that letter 'inverted.' Ones replace zeroes, and zeroes ones. That's inverse. To 'print' an inverse character, the Apple doesn't need a special font. It just 'flips' the image when it encounters the INVERSE command.

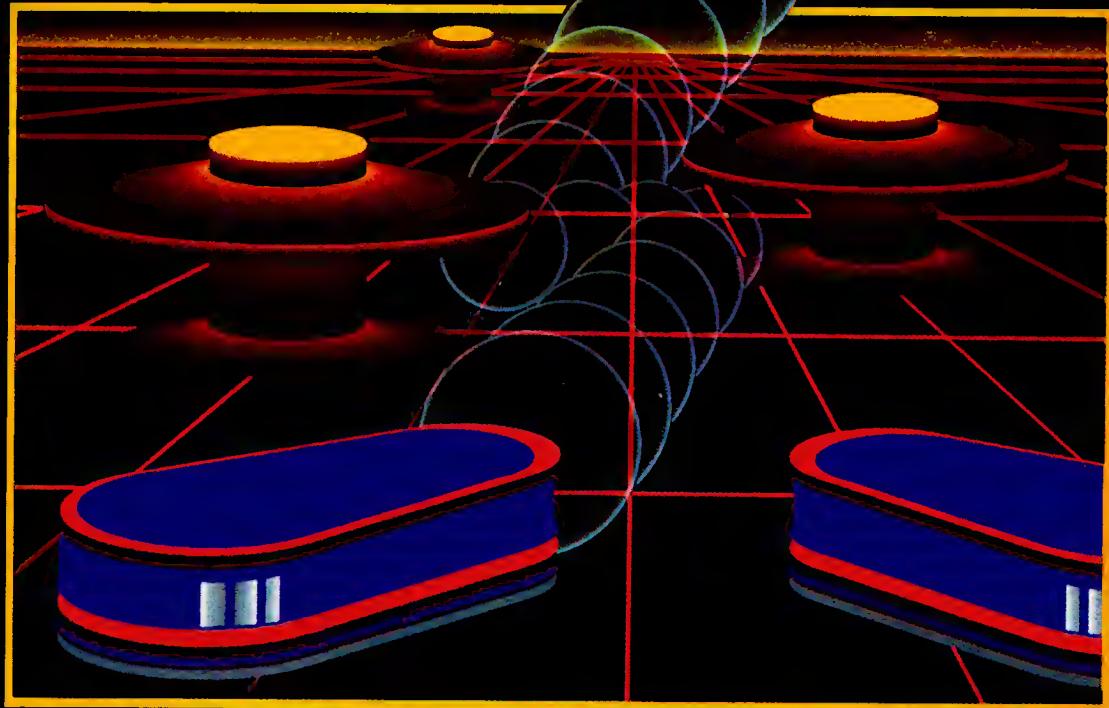
The flashing display is merely the very rapid shifting between the normal and the inverse mode, made possible because the screen is continually 'refreshed.' The character generator is always sending signals to the video, and when the FLASH code is in a memory location, inverse and normal transmissions alternate.

Know more about ASCII than you ever wanted to know? I'm sorry. For some of us, hunting is such a passion that we can't rest until the trophy is tamely hanging above the fireplace. ■

# TAKE A BREAK!

Circle 156 on Reader Service card.

For Apple II,  
Apple II+,  
and Apple Ile



## WITH NIGHT MISSION **PINBALL**

You deserve the best. You've earned it. Now reward yourself with a session of **Night Mission PINBALL**, the most realistic and challenging arcade simulation ever conceived! ■ Stunning graphics and dazzling sound effects put **Night Mission PINBALL** in a class by itself. Game features: multi-ball and multi-player capabilities, ten different professionally designed levels of play, and an editor that lets you create *your own custom modes*. ■ So take a break with **Night Mission PINBALL** from SubLOGIC. Winner of *Electronic Games* magazine's 1983 Arcade Award for Best Computer Audio/Visual Effects.



**See your dealer . . .**

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. Illinois residents add 5% sales tax. American Express, Diner's Club, MasterCard, and Visa accepted.

**Order Line: 800/637-4983**

**subLOGIC**  
Corporation  
713 Edgebrook Drive  
Champaign IL 61820  
(217) 359-8482 Telex: 206995

# Title Slides Without Peer

Follow this doctor's orders to design and produce unique title sequences for your slide shows.

by Kenneth A. Deitcher, M.D.

To make my slide programs more professional and interesting, I use an Apple II Plus and a Gibson light pen to generate slide titles. My system has 64K of memory, two disk drives, and a standard 18-inch color television set.

The Gibson LP II allows you to draw a black and white image directly on the color monitor screen. In the edit mode, you can correct irregularities of the freehand drawing, deleting or adding black or white pixels and saving the completed drawing. The final image is saved to the disk by touching the pen to the appropriate spot on the screen and typing the name given to your drawing.



The images can be drawn symmetrically in the vertical or the horizontal axis or both to create a frame in which to insert text for a title. A touch of the pen fills the design in the frame with color. Over 100 color patterns are included on the disk and you can design your own patterns with a program called Penpainter. The only require-

ment for a good design is to make sure all lines are complete. If any gaps exist, the color will run into other areas.

You can add or change color patterns any number of times, then your completed picture can be saved and photographed. I keep all my initial uncolored drawings on a separate disk in case I want to make a different color design in the future. Once a drawing is colored in, no further manipulation can be carried out with the light pen.

I use several graphic programs to

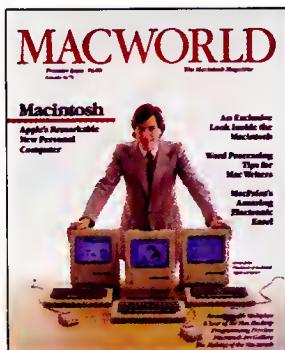
---

*Dr. Kenneth A. Deitcher creates his masterpieces at 3 Lockrow Ave., Box 5162, Albany, NY 12205.*



# Introducing MACWORLD

*The Macintosh Magazine*



**The Exciting New Magazine for the World's  
Most Creative Personal Computer—the *Macintosh***

**At Special Charter Subscriber Rates  
Save Up to 54% Off the Newsstand Price\***  
(\*when you subscribe for 3 years)

Personal computing took a giant leap into the future when Apple introduced the Macintosh. We've created *Macworld* as your passport into this incredible new realm of computing. Each issue we'll bring you everything you need to explore and get the most out of your Macintosh. From the latest product news to innovative business applications, from amazing graphics to personal productivity tools and games, each issue of *Macworld* will be packed with interesting, practical, readable information written by skilled, perceptive writers.

Each month we'll be creating a *Macworld* community, sharing ideas, problems, and creative solutions while we explore the world of Macintosh together.

So why take a chance on missing a single exciting issue? For a limited time only you can subscribe to *Macworld* at special Charter Subscriber rates of only

**\$24 for 1 year (12 issues)**

That's a savings of 20% off the regular \$30 subscription rate and 50% off the newsstand price!

**And you can save even more by subscribing for 2 or 3 years at  
Special Charter Rates. Don't Wait...Subscribe Today and Save!  
Call Toll-Free 800/247-5470 (in Iowa 800/532-1272)**



Macworld  
Subscription Department  
P.O. Box 20300  
Bergenfield, New Jersey 07621

I ACCEPT! Please send me *Macworld*, the Macintosh magazine.

Please Bill Me    Payment Enclosed  
 Please Charge my    MasterCard    Visa

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Interbank # (mc only) \_\_\_\_\_ Signature \_\_\_\_\_

Please Send Me:

12 issues/\$24    24 issues/\$46    36 issues/\$66

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Subscriptions begin with the next available issue. Please allow 6-8 weeks for delivery of your first issue. Outside the U.S. subscriptions must be prepaid in U.S. funds. Outside the U.S. and Canada add \$12 per year additional postage for surface mail and \$60 per year for airmail. Allow an additional 4 weeks for delivery by foreign surface mail. **This offer expires July 31, 1984.**

modify and add various sized text and font styles, in colors, to the title slide. I use Rainbow Writer by Personal Software, Alpha Plot, and Apple Mechanic with Typefaces, all by Beagle Brothers. Rainbow Writer lets you enter text anywhere on your slide in eight sizes and colors. Alpha Plot draws lines, circles and rectangles within your frame, and shifts and merges several images. Apple Mechanic and Typefaces add over 30 different font styles.

The average time to make a slide is 15 minutes. The slide titles, when complete, are saved to disk. At this point, I photograph my creation on 35mm color slide film. The camera I use is a Canon A1 with a 70-210mm macro-zoom lens set on macro mode. The camera is placed on a tripod approximately two feet from the color monitor. I use daylight color slide film (I prefer Fujichrome with an ASA of 100). I set my lens aperture at f22 and set my camera on programmed aperture-preferred mode. This allows the camera to select the appropriate speed



*The author using the Gibson light pen.*

for the f-stop. In this case, the speed is usually around 1/15 to 1/30 second, and at this speed I get no scanning lines. The exposure is made in a completely darkened room to avoid reflections. The best photographs are obtained from slides with a black back-

ground, and, to get deeper color saturation, I underexpose the film slightly. Using a 36-frame roll of color slide film with some bracketing, the cost of a slide is approximately 50 to 75 cents, including processing and mounting. ■



*The camera is ready to photograph the drawing on the video screen.*

When you're ready to add disk drives to your system, pick them carefully. Get all the options you need, but don't pay for features you'll never use.

You get that flexibility in Microsci 5 1/4" floppy disk drives. Choose from a selection that includes everything from a beginner's first add-on to large capacity, high-speed subsystems right for the busiest office environment.

Microsci's **Model A2** is a superbly crafted 35-track drive which is completely compatible with all Apple II® and IIe® hardware and software. The **A2** features a jumper-selectable boot PROM and a price tag our competitors envy. Just right for the budget-conscious consumer!

Attention programmers and word processors! You need no longer sacrifice pre-packaged software compatibility in favor of large storage when you buy a floppy disk drive for your Apple II or IIe. The **Model A82** from Microsci combines a full 328K capacity—more than twice the speed of a Disk

II®—with the ability to read standard 35-track software.

Apple III® owners will appreciate the **Model A3**. It offers all the features and benefits of the Disk III® at a fraction of the price. Ideal as a second drive!

At 286K, Microsci's **Model A73** provides Apple III users with twice the capacity of the Disk III; and, it plugs right in to the built-in controller—no extra boards or power cord required!

The king of all Apple-compatible drives is the Microsci **Model A143**, the largest 5 1/4" floppy disk storage system available for the Apple III. 572K storage capacity and 5 msec access time make A143's both cost-effective primary storage and powerful back-up devices.

One option you'll never see on a Microsci drive is a princely price tag—we control your costs as carefully as we control our quality. So drive carefully to your nearest computer center for a demonstration of Microsci craftsmanship and quality. Do it today!



# DRIVE CAREFULLY.

\*Apple II, Apple IIe, Apple III, Disk II and Disk III are registered trademarks of Apple Computer Co.



Circle 371 on Reader Service card.

# Stack Attack

From scratch paper to fogged-up glass to your computer screen, the enduring popularity of tick-tack-toe enters the fourth dimension.

by Subu Magge

**S**tack Attack (Listing 1) is a hi-res strategy game pitting you against your computer to place four markers in any row, column, or diagonal of a 4-by-4-by-4 cube. White X's indicate computer moves and your moves show up as red O's. You'll have to think several moves ahead if you want to win against the computer's strategy.

#### Winning Combinations

The "game board" has 64 numbered "squares" (Figure 1), stored in the array

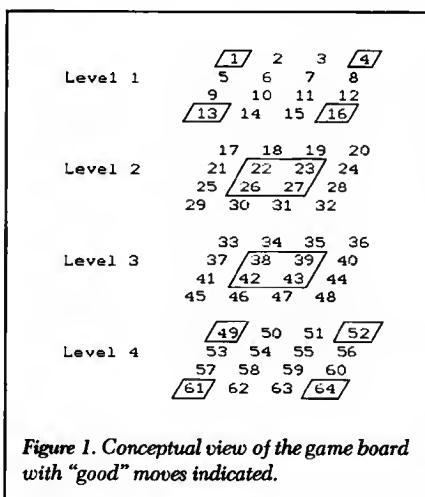


Figure 1. Conceptual view of the game board with "good" moves indicated.

X(64). If you occupy a square, the corresponding square number in this array has a value of 1. The quantity of -.3 indicates a computer square. There are 76 possible combinations for winning moves. The computer stores the combinations in M(76,4); the first

*Listing 1. Stack Attack.*

```

10 REM SUBU MAGGE
20 REM JANUARY 9, 1984
30 REM STACK ATTACK
40 REM
50 REM -----
60 HOME
70 PRINT TAB( 14)"STACK ATTACK"
80 PRINT TAB( 14)"-----"
90 PRINT TAB( 19)"BY"
100 PRINT TAB( 15)"SUBU MAGGE"
110 PRINT TAB( 19)"ON"
120 PRINT TAB( 12)"JANUARY 9, 1984"
130 PRINT
140 PRINT
150 PRINT " THIS GAME IS PLAYED IN A 4X4X4 "
160 PRINT "CUBE. YOU MUST TRY TO PLACE FOUR MARK-"
170 PRINT "ERS IN ANY ROW, COLUMN, OR DIAGONAL IN "
180 PRINT "ANY OF THE THREE PLANES. TO ENTER YOUR"
190 PRINT "MOVE, YOU MUST TYPE IN THE BOARD LEVEL,"
200 PRINT "ROW, AND COLUMN IN THAT ORDER SEPARATED"
210 PRINT "BY COMMAS. YOUR MOVES WILL BE INDICATED";
220 PRINT "BY AN 'O' AND MINE WILL BE INDICATED BY"
230 PRINT "AN 'X'. ALTHOUGH YOU ARE DOOMED TO LOSE";
240 PRINT "I WISH YOU GOOD LUCK--YOU WILL NEED IT!"
250 PRINT
260 PRINT
270 PRINT "PRESS ANY KEY TO CONTINUE ";
280 GET CO$
290 LET DOSS$ = CHR$( 4 )
300 LET Z = 0
310 TEXT
320 HOME
330 PRINT "DO YOU WISH TO GO FIRST ";
340 GET AN$: PRINT AN$
350 IF AN$ = "Y" OR AN$ = "N" THEN 430
360 INVERSE
370 GOSUB 4560
380 PRINT "INCORRECT ANSWER--TYPE 'Y' OR 'N'"
390 NORMAL
400 PRINT
410 GOTO 330
420 REM EXECUTE SUBROUTINE TO READY BOARD AND DIMENSIO
N VARIABLES
430 GOSUB 2570
440 REM RESET INDICATOR THAT TELLS IF PLAYING REPEATED
LY
450 LET Z = 1
460 IF LEFT$( AN$,1 ) < > "N" THEN 490
470 LET D = 2

```

*Listing continued.*

*Listing continued.*

```

480 GOTO 2330
490 PRINT "ENTER MOVE (LEV,ROW,COL)--> ";
500 INPUT A,B,C
510 IF (A = 1 OR A = 2 OR A = 3 OR A = 4) AND (B = 1 OR
    B = 2 OR B = 3 OR B = 4) AND (C = 1 OR C = 2 OR C =
    3 OR C = 4) THEN 580
520 INVERSE
530 GOSUB 4560
540 PRINT "MOVE IS INCORRECT--PLEASE RETYPE"
550 NORMAL
560 GOTO 490
570 REM REDEFINE MOVE AS SQUARE NUMBER (1-64)
580 LET SQ = 16 * A + 4 * B + C - 20
590 REM TEST IF SQUARE IS OCCUPIED
600 IF X(SQ) = 0 THEN 670
610 INVERSE
620 GOSUB 4560
630 PRINT "THAT SQUARE IS ALREADY FILLED--TRY AGAIN";
640 NORMAL
650 GOTO 490
660 REM MARK SQUARE AS FILLED
670 LET X(SQ) = 1
680 REM SET SHAPE NUMBER/COLOR AND GOTO SUBROUTINE TO
    PLOT MOVE
690 LET D = 1
700 HCOLOR= 5
710 GOSUB 4420
720 REM RESET SHAPE NUMBER AND COLOR
730 LET D = 2
740 HCOLOR= 3
750 REM -----
-----
760 REM LOOP TO ADD UP TOTALS OF EACH WINNING COMBINAT
ION
770 FOR G = 1 TO 76
780 LET L(G) = X(M(G,1)) + X(M(G,2)) + X(M(G,3)) + X(M(
    G,4))
790 REM TEST IF PLAYER WINS
800 IF L(G) < > 4 THEN 930
810 HOME : VTAB 21
820 GOSUB 4560: GOSUB 4560: SPEED= 100
830 PRINT "CONGRATULATIONS!!--YOU'VE DONE THE           IMPO
    SSIBLE--YOU WIN WITH THESE MOVES: "
840 SPEED= 255
850 FOR J = 1 TO 4
860 GOSUB 4500
870 PRINT A;" ;B;" ;C;" ;
880 NEXT J
890 PRINT "WANT TO PLAY ANOTHER GAME ";
900 INPUT PA$
910 IF LEFT$(PA$,1) = "Y" THEN 310
920 HOME : VTAB 21: PRINT "THANKS FOR THE GOOD GAME!!!"
    : END
930 NEXT G
940 REM -----
950 REM LOOP TO SEE IF COMPUTER HAS WINNING MOVE
960 FOR G = 1 TO 76
970 IF L(G) > - .8 THEN 1190
980 REM LOOP TO FIND OPEN SQUARE
990 FOR J = 1 TO 4
1000 IF X(M(G,J)) < > 0 THEN 1180
1010 GOSUB 4500
1020 REM DRAW MOVE
1030 GOSUB 4420
1040 HOME : VTAB 21
1050 GOSUB 4560: GOSUB 4560: SPEED= 100
1060 PRINT "TOUGH LUCK!!! I MOVE TO ";
1070 PRINT A;" ;B;" ;C;" AND WIN AS FOLLOWS: "
1080 REM LOOP TO PRINT WINNING MOVES
1090 FOR J = 1 TO 4
1100 GOSUB 4500
1110 PRINT A;" ;B;" ;C;" ;
1120 NEXT J
1130 SPEED= 255
1140 PRINT "WANT TO PLAY ANOTHER GAME ";
1150 INPUT PA$
1160 IF LEFT$(PA$,1) = "Y" THEN 310
1170 HOME : VTAB 21: PRINT "THANKS FOR THE GOOD GAME!!!"
    : END

```

*Listing continued.*

# THE BYTE GENERAL

3 Sierks Lane • Roslyn Harbor, NY 11576  
24 Hour Order Line

**Orders: 516-625-0920**

**Technical: 516-484-6391**

#### Apple IIe Starter System

##### *Includes:*

Apple IIe 64k, Drive w/Controller  
Apple IIe Monitor w/Tilt Screen  
80 Column Card, Tutorial Diskette  
Monitor Stand.  
ONLY \$1295.00

#### *Printers:*

Prowriter 8510a	\$345.00
Gemini 10X	\$269.95
Okidata 92m1	\$425.00
Prowriter Ribbons	\$ 7.00

#### *Modems:*

Micromodem IIe w/Term	\$239.95
Hayes 300 Smartmodem	\$199.95
Hayes 1200 Smartmodem	\$469.95
Novation J-Cat Modem	\$100.00
Novation Applecat II	\$249.95

#### *Apple Disk Drives:*

Apple Disk Controller Card	\$ 55.00
Rana Elite I Disk Drive	\$255.00
Shugart 40trk Disk Drive	\$199.95
Slimline 40trk (Direct Drive)	\$199.95
Slimline 40trk (Belt Driven)	\$199.95

#### *Diskettes:*

Elephant #1 SS/SD Soft	\$ 15.95
Elephant #2 SS/DD Soft	\$ 18.95

#### *Apple Add-ons:*

MPC Parallel Card/Cable	\$ 55.00
MPC 64k 80 Column Card IIe	\$109.00
CCS Serial Card	\$109.00
Kensington System Saver Fan	\$ 65.00
Wildcard Copy Device	\$ 92.00
Wildcard II Plus	\$135.00
ALS CP/M Card	\$289.95
ALS ZCard II	\$199.95
Videx Videoterm (80 Col.)	\$179.95
Videx Videoterm Combo Pack	\$209.95
Videx Ultraterm (160 Col.)	\$250.00
Kraft Joystick	\$ 34.95
Koala Graphics Tablet	\$ 78.00
Orange Micro Grappler +	\$119.00
Orange Micro Buffered Grappler	\$175.00
9½" X 11" Printer Paper Laser Edges	\$ 28.95

#### DEALER INQUIRIES INVITED

#### TERMS OF SALE:

There is a 3% charge for Master Card or Visa. When ordering, please add the following amounts for shipping: Diskettes — \$3.00, Hardware — \$5.00 per order. Personal checks - allow two weeks for bank clearance. NY State Residents add 8.25% Sales Tax. Prices and terms are subject to change without notice.

CO\$	Pause
M(76,4)	Table listing combinations to check—a winning combination is stored as a sequence of square numbers.
Y(16)	Array of square numbers telling best possible moves
X(64)	Array that tells if square is filled
L(76)	Array that indicates what is in a combination
PB(76)	Array to tell if a player block deserves remark
AN\$	Tells who moves first
DOS\$	CHR\$(4)—To access disk
I	Index of loops that set initial array values
A	Level part of move
B	Row part of move
C	Column part of move
SQ	Square number (1-64) of move
D	Shape number to be drawn (1 for player, 2 for computer)
G	Index of loop that "adds" up the values for a combination
PA\$	Tells if player wants to play again
J	Index of loop that prints winning moves
K	Index of loop to see if computer can win
U	Index of loop to see if computer should block
T	Index of loops that find empty square of a combination
W	Index of loop to move to combination with 2 in it
Q	Index of loop to find best possible move
H	Index of loop that sees if there is a draw
Z	Indicator to see whether game is being played for first time
AA	Index of loop that flashes moves
P%	Pointer to a comment
NO	Index of loop for bell
BB	Index of loop to see if player has blocked

Table. Variables.

*Listing continued.*

```

1180 NEXT J
1190 NEXT G
1200 REM -----
1210 REM TEST IF PLAYER HAS BLOCKED A WINNING MOVE
1220 FOR X = 1 TO 76
1230 IF L(X) < > ( - .3 + - .3 + - .3 + 1) THEN 1360

1240 REM TEST IF BLOCK MADE IN A PREVIOUS MOVE
1250 IF PB(X) = 1 THEN 1360
1260 LET PB(X) = 1
1270 LET P% = RND (1) * 5 + 1
1280 HOME : VTAB 21
1290 GOSUB 4560
1300 ON P% GOTO 1310,1320,1330,1340,1350
1310 PRINT "YOU CLEVER FOX!!! I'LL GET YOU YET!!!": GOTO
1390
1320 PRINT "PRETTY SHARP---BUT I'LL GET YOU SOON!!!": GOTO
1390
1330 PRINT "THINK YOU'RE CLEVER HUH? YOU JUST WAIT!": GOTO
1390
1340 PRINT "AT LEAST YOU'RE KEEPING THE GAME CLOSE!": GOTO
1390
1350 PRINT "YOU'RE JUST DELAYING THE INEVITABLE!!!": GOTO
1390
1360 NEXT X
1370 REM -----
1380 REM LOOP TO SEE IF COMPUTER NEEDS TO BLOCK
1390 FOR G = 1 TO 76
1400 IF L(G) < > 3 THEN 1630
1410 REM LOOP TO FIND OPEN SQUARE
1420 FOR J = 1 TO 4
1430 IF X(M(G,J)) = 0 THEN 1460
1440 NEXT J
1450 REM SET SUBROUTINE VARIABLES AND EXECUTE TO FIND
A,B,C
1460 GOSUB 4500
1470 HOME : VTAB 21
1480 GOSUB 4560

```

*Listing continued.*

dimension is the combination number and the second determines the square number in the sequence.

In each winning square combination, the computer adds the numbers in the X array for each square in the combinations stored in M(76,4). The computer stores this number in the array L(76); the dimensions correspond to the combination number in M(76,4). The L array indicates how many squares are occupied by whom in each of the 76 winning combinations. Thus, if the fourth combination, M(4), had two of your markers and one of the computer's, L(4) would equal 1.7 (-.3 + 1 + 1). Consult the table for a further

"You'll have to think several moves ahead if you want to win against the computer's strategy."

listing of the variables and their functions.

The computer moves by checking several priorities in a specific order indicated by the values in the L array. The process begins with a test of whether you have won by checking if any value in the L array is 4. If not, the computer searches for a winning move, indicated by a value of -.9 in the L array. If not, it then checks to see if you have three in a combination, signified by a 3 for any L array value, a condition that demands an immediate block. If this proves false, the computer tries to find a combination containing only two of its markers, indicated by an L array value of -.6, in order to place a third.

If it finds none, the computer for two combinations, each with two of your markers, sharing a copied square. By filling the square, the computer preve

*Listing continued.*

```

1490 LET P% = 5 * RND (1) + 1
1500 ON P% GOTO 1510,1520,1530,1540,1550
1510 PRINT "THINK YOU'RE CLEVER DON'T YOU?": GOTO 1560
1520 PRINT "YOU'VE GOT TO DO BETTER THAN THAT!!": GOTO
1560
1530 PRINT "YOU'VE GOT TO BE REAL FAST TO BEAT ME!!": GOTO
1560
1540 PRINT "TRYING TO OUT-FOX ME, HUH!!!": GOTO 1560
1550 PRINT "WHILE THE SUN SHINES YOU CAN'T BEAT ME!"
1560 PRINT "I MOVE TO BLOCK YOU AT ";A;" ";B;" ";C
1570 REM DRAW MOVE
1580 GOSUB 4420
1590 REM STORE MOVE
1600 LET X(M(G,J)) = -.3
1610 REM RESTART PROCESS
1620 GOTO 490
1630 NEXT G
1640 REM -----
1650 REM LOOP TO SEE IF 2 IN ROW FOR COMPUTER
1660 FOR G = 1 TO 76
1670 IF L(G) < > -.6 THEN 1820
1680 REM LOOP TO FIND AN OPEN SQUARE
1690 FOR J = 1 TO 3
1700 IF X(M(G,J)) < > Ø THEN 1810
1710 REM SET SUBROUTINE VARIABLES AND FIND A,B,C
1720 GOSUB 4500
1730 REM DRAW SHAPE
1740 GOSUB 4420
1750 HOME : VTAB 21
1760 PRINT "I SHALL MOVE TO ";A;" ";B;" ";C
1770 REM STORE MOVE
1780 LET X(M(G,J)) = -.3
1790 REM RESTART PROCESS
1800 GOTO 490
1810 NEXT J
1820 NEXT G
1830 REM -----
1840 REM SEE IF PLAYER HAS 2 MARKERS IN 2 COMB WITH CO
MMON SQUARE
1850 LET E = Ø
1860 FOR X = 1 TO 76
1870 IF L(X) < > 2 THEN 1900
1880 LET E = E + 1
1890 LET K(E) = X
1900 NEXT X
1910 IF E < 2 THEN 2170
1920 REM LOOPS TO COMPARE THE COMBINATIONS TO EACH OTH
ER
1930 FOR N = 1 TO E - 1
1940 FOR O = N + 1 TO E
1950 REM LOOPS TO FIND COMMON SQUARE
1960 FOR J = 1 TO 4
1970 FOR G = 1 TO 4
1980 IF M(K(N),J) = M(K(O),G) THEN 2030
1990 NEXT G
2000 NEXT J
2010 GOTO 2130
2020 REM IF SQUARE NOT OPEN KEEP CHECKING
2030 IF X(M(K(N),J)) < > Ø THEN 2130
2040 REM SET SUBROUTINE VARIABLES AND FING A,B,C
2050 LET G = K(N)
2060 GOSUB 4500
2070 HOME : VTAB 21
2080 PRINT "HA HA...I KNOW WHAT YOU'RE UP TO!!": PRINT
"I MOVE TO ";A;" ";B;" ";C
2090 REM DRAW MOVE
2100 GOSUB 4420
2110 LET X(M(K(N),J)) = -.3
2120 GOTO 490
2130 NEXT O
2140 NEXT N
2150 REM -----
2160 REM LOOP TO SEE IF THERE IS A DRAW
2170 FOR H = 1 TO 64
2180 IF X(H) = Ø THEN 2330
2190 NEXT H
2200 REM ALL SQUARES ARE FULL WITHOUT A WINNER

```

*Listing continued.*

# THE STATISTICS SERIES

FLEXIBLE • ACCURATE  
EASY-TO-USE

Human Systems Dynamics programs are used by leading universities and medical centers. Any program that doesn't suit your needs can be returned within 10 days for full refund. Designed for use with Apple II 48K, 1 or 2 Disk Drives, 3.3 DOS, ROM Applesoft.

**NEW****REGRESS II**

\$150

Complete Multiple Regression Series  
Stepwise, Simultaneous Solutions  
Forward, Backward Solutions  
Auto Power Polynomial Solutions  
Data Smoothing, Transformations  
Correlation and Covariance Matrices  
Residuals Analysis, Partial Correlation  
Research Data Base Management  
Count, Search, Sort, Review/Edit  
Add, Delete, Merge Files  
Curve Fit. Hi-Res X-Y Plot

**STATS PLUS**

\$200

Complete General Statistics Package  
Research Data Base Management  
Count, Search, Sort, Review/Edit  
Add, Delete, Merge Files  
Compute Data Fields, Create Subfiles  
Produce Hi-Res Bargraphs, Plots  
1-5 Way Crosstabulation  
Descriptive Statistics for All Fields  
Chi-Square, Fisher Exact, Signed Ranks  
Mann-Whitney, Kruskal-Wallis, Rank Sum  
Friedman Anova by Ranks  
10 Data Transformations  
Frequency Distribution  
Correlation Matrix, 2 Way Anova  
r, Rho, Tau, Partial Correlation  
3 Variable Regression, 3 t-Tests

**ANOVA II**

\$150

Complete Analysis of Variance Package  
Analysis of Covariance, Randomized Designs  
Repeated Measures, Split Plot Designs  
1 to 5 Factors, 2 to 36 Levels Per Factor  
Equal N or Unequal N, Anova Table  
Descriptive Statistics, Marginal Means  
Cell Sums of Squares, Data File Creation  
Data Review/Edit, Data Transformations  
File Combinations, All Interactions Tested  
High Resolution Mean Plots, Bargraphs



HUMAN SYSTEMS DYNAMICS

To Order—Call (213) 993-8536  
or Write  
HUMAN SYSTEMS DYNAMICS  
9010 Reseda Blvd. Suite 222  
Northridge, CA 91324



Dealer Inquiries Invited



*Listing continued.*

```
2210 HOME : VTAB 21
2220 GOSUB 4560: GOSUB 4560
2230 PRINT "THIS IS INCREDIBLE--YOU HAVE FORCED A "
2240 PRINT "DRAW. DO YOU HAVE THE NERVE TO TRY TO "
2250 PRINT "BEAT ME ";
2260 INPUT PA$
2270 REM TEST IF USER WANTS ANOTHER GAME
2280 IF LEFT$(PA$,1) = "Y" THEN 310
2290 PRINT "THANKS ANYWAY FOR THE GOOD GAME"
2300 HOME : VTAB 21: PRINT "THANKS FOR THE GOOD GAME!!"
": END
2310 REM -----
2320 REM LOOP TO PICK BEST POSSIBLE MOVE
2330 FOR Q = 1 TO 16
2340 REM TEST IF SQUARE IS EMPTY
2350 IF X(Y(Q)) = 0 THEN 2400
2360 NEXT Q
2370 REM USE ANY OPEN SQUARE
2380 LET Y(Q) = H
2390 REM FIND A,B,C
2400 LET A = INT ((Y(Q) - 1) / 16) + 1
2410 LET B = INT (((Y(Q) - 16 * (A - 1)) - 1) / 4) + 1
2420 LET C = Y(Q) - (A - 1) * 16 - (B - 1) * 4
2430 REM DRAW SHAPE
2440 GOSUB 4420
2450 HOME : VTAB 21
2460 PRINT "I SHALL MOVE TO ";A;";";B;";";C
2470 REM STORE MOVE
2480 LET X(Y(Q)) = -.3
2490 REM RESTART PROCESS
2500 GOTO 490
2510 END
2520 REM
2530 REM -----
2540 REM THE FOLLOWING ARE SUBROUTINES USED IN THE PROGRAM
2550 REM -----
2560 REM SUBROUTINE TO READY GAME
2570 HGR
2580 TEXT
2590 HOME
2600 VTAB (12)
2610 PRINT "ONE MOMENT PLEASE TILL I SET UP THE GAME"
2620 REM TEST IF PLAYING FOR REPEATED TIME (DONT WANT TO REDIM)
2630 IF Z > 0 THEN 3010
2640 REM ELSE--PLAYED FOR 1ST TIME--DIMENSION VARIABLE S
2650 DIM Y(17)
2660 DIM M(76,4)
2670 DIM X(64)
2680 DIM L(76)
2690 DIM K(76)
2700 DIM PB(76)
2710 REM
2720 LET DOS$ = CHR$(4)
2730 REM LOOP TO READ DATA FOR BEST POSSIBLE MOVES
2740 FOR X = 1 TO 16
2750 READ Y(X)
2760 NEXT X
2770 REM LOOP TO READ DATA FOR WINNING COMBINATIONS TO CHECK
2780 FOR X = 1 TO 76
2790 READ M(X,1),M(X,2),M(X,3),M(X,4)
2800 NEXT X
2810 REM BEST POSSIBLE MOVES
2820 DATA 1,49,52,4,13,61,64,16,22,39,23,38,26,42,27,4
3
2830 REM HORIZONTAL ON EACH LEVEL
2840 DATA 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52
,53,54,55,56,57,58,59,60,61,62,63,64
2850 REM VERTICAL ON EACH LEVEL
```

*Listing continued.*

from acquiring three markers in two combinations, which would have enabled you to wrap up the game on the next move. If this situation does not exist, the computer checks if all the

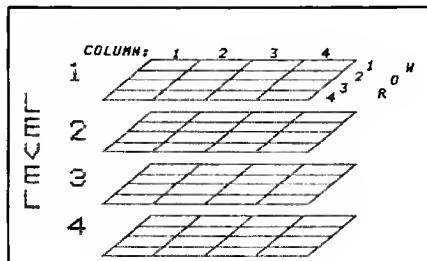


Figure 2. The game board.

squares are occupied and there is a draw.

If all else fails, the computer picks from a list of 16 "good" moves. These squares are the ones in the maximum number of combinations. The four middle squares of both the central levels and the four edge squares of the outer levels are each members of seven different combinations, thus earning them the distinction of being "good" moves (Figure 1). Make your move and the process begins again.

#### Program Line Explanation

60-480 give the directions and determine who goes first. They also execute a subroutine to draw the board (Figure 2) and ready the variables.

490-740 accept a player move and go to the appropriate subroutines to draw it, while storing the move with a 1 in the appropriate X array location.

760-930 add up the value of each square, stored in X(64), in the 76 possible winning combinations stored in M(76,4), and store these sums in L(76). Also, these lines check if the player has made a winning move indicated by an L array value of 4.

950-1190 check to see if any L array value is -.9, which would indicate an imminent winning move for the computer.

1210-1360 check if the player has blocked a three-in-a-row situation for the computer, indicated by .1 for an L array value. If this is true, an appropriate message is printed.

1380-1630 check to see if the computer

*Listing continued.*

```

2860 DATA 1,5,9,13,2,6,10,14,3,7,11,15,4,8,12,16,17,21
,25,29,18,22,26,30,19,23,27,31,20,24,28,32,33,37,41
,45,34,38,42,46,35,39,43,47,36,40,44,48,49,53,57,61
,50,54,58,62,51,55,59,63,52,56,60,64
2870 REM VERTICAL THROUGH LEVELS
2880 DATA 1,17,33,49,2,18,34,50,3,19,35,51,4,20,36,52,
5,21,37,53,6,22,38,54,7,23,39,55,8,24,40,56,9,25,41
,57,10,26,42,58,11,27,43,59,12,28,44,60,13,29,45,61
,14,30,46,62,15,31,47,63,16,32,48,64
2890 REM DIAGONALS ON EACH LEVEL
2900 DATA 1,6,11,16,13,10,7,4,17,22,27,32,29,26,23,20
,33,38,43,48,45,42,39,36,49,54,59,64,61,58,55,52
2910 REM DIAGONALS THROUGH LEVELS
2920 DATA 1,21,41,61,13,25,37,49,2,22,42,62,14,26,38,5
0,3,23,43,63,15,27,39,51,4,24,44,64,16,28,40,52,1,1
8,35,52,4,19,34,49,5,22,39,56,8,23,38,53,9,26,43,60
,12,27,42,57,13,30,47,64,16,31,46,61
2930 REM DIAGONALS OF 'CUBE'
2940 DATA 1,22,43,64,16,27,38,49,13,26,39,52,4,23,42,6
1
2950 REM LOAD SHAPE TABLE AND SET POINTER (METHOD BY J
EFFREY A. MILLS)
2960 PRINT DOS$;"BLOAD SHAPES,A";( PEEK (176) * 256 + PEEK
(175) + 1)
2970 POKE 232,( PEEK (175) + 1): POKE 233,( PEEK (176))
2980 ROT= 0
2990 SCALE= 1
3000 REM INITIALIZE VARIABLES
3010 FOR X = 1 TO 64
3020 LET X(X) = 0
3030 NEXT X
3040 FOR X = 1 TO 76
3050 LET L(X) = 0
3060 NEXT X
3070 REM ----- PLOT BOARD -----
3080 REM PLOT 4 LEVELS
3090 HCOLOR= 3
3100 FOR X = 0 TO 3
3110 HPLOT 80,8 + 39 * X TO 210,8 + 39 * X TO 180,38 +
39 * X TO 50,38 + 39 * X TO 80,8 + 39 * X
3120 REM HORIZONTAL/VERTICAL LINES
3130 FOR Y = 1 TO 3
3140 HPLOT 80 + 32.5 * Y,8 + 39 * X TO 50 + 32.5 * Y,38
+ 39 * X
3150 HPLOT 51 + 7.5 * Y,(39 - 7.56 * Y) + 39 * X TO 179
+ 7.5 * Y,(39 - 7.56 * Y) + 39 * X
3160 NEXT Y,X
3170 REM -----
3180 REM "LEVEL"
3190 REM "L"
3200 FOR X = 34 TO 106 STEP 72
3210 FOR Y = 1 TO 2
3220 HPLOT Y,X TO Y,X + 13
3230 HPLOT 1,X + Y + 11 TO 10,X + Y + 11
3240 NEXT Y,X
3250 REM "E"
3260 FOR X = 52 TO 88 STEP 36
3270 FOR Y = 1 TO 2
3280 HPLOT Y,X TO Y,X + 13
3290 NEXT Y
3300 FOR Y = X TO X + 13 STEP 6
3310 FOR Z = 0 TO 1
3320 HPLOT 1,Y + Z TO 10,Y + Z
3330 NEXT Z,Y,X
3340 REM "V"
3350 FOR X = 1 TO 9 STEP 8
3360 HPLOT X,70 TO X,75
3370 HPLOT X + 1,70 TO X + 1,75
3380 NEXT X
3390 HPLOT 2,76 TO 6,83 TO 9,76
3400 HPLOT 1,76 TO 6,83 TO 10,76

```

*Listing continued.*

**Only Titan's Neptune™ provides Apple IIe users with an 80-column video display and up to 192K memory—all in just one slot.**

Now, Titan's exclusive Neptune extended 80-column card gives you increased video display and up to 192K memory using just one slot in your Apple IIe. Designed expressly for the auxiliary slot of the IIe, the Neptune is available with 64K, 128K or 192K of RAM memory. The RAM memory can be



utilized as a solid state RAM disk. Additionally, Titan's VC-EXPAND/80™ software supplied with each Neptune expands VisiCalc® up to 220K of workspace memory and provides many other VisiCalc enhancements. DOS, PASCAL and CP/M® PSEUDO-DISK™ patches and a DOS relocation program are also included with each Neptune card.

Let us help you expand your Apple's productivity. For information on the Neptune and other Titan microcomputer products, see your computer dealer or contact: Titan Technologies, Inc., P.O. Box 8050, Ann Arbor, MI 48107; Telephone (313) 973-8422.

Sales and Marketing by The MARKETING RESOURCE GROUP, Costa Mesa, CA.

**Titan**  
TECHNOLOGIES, INC.  
FORMERLY SATURN SYSTEMS OF MICHIGAN

Apple is a registered trademark of Apple Computer, Inc  
VisiCalc is a registered trademark of VisiCorp, Inc  
CP/M is a registered trademark of Digital Research, Inc  
VC-EXPAND software is written by Micro Solutions, Inc.  
Neptune and PSEUDO-DISK are trademarks of Titan Technologies, Inc.

# Quality you expect, at a price you don't.

## BECK DOUBLE DENSITY DISKETTES

SINGLE SIDED

\$2.19 / \$2.79

DOUBLE SIDED

ea.

ea.

Our message to you is simple. If you like the quality of Dysan, Verbatim, 3M, et al, you'll like the quality of Beck soft sector, 5 1/4" flexible diskettes. The only major difference is cost. We're less expensive. In fact, a lot less expensive.

### Why does Beck cost less?

Our philosophy is: Excellent quality and reliability, at a cost that beats the jackets off other diskettes. We can do it because we (1) put our money into the product, not mega-marketing schemes and fancy packaging; and (2) sell our money-saving 25-diskette pack to you direct via a toll free order line, so you get fast, door-to-door service efficiently.

**When you buy Beck, you've got the best.**

**Beck Quality. Beck Reliability.**

**And, of course, Beck Price.**

1D, soft sector 5 1/4" diskette \$2.19 each

2D, soft sector 5 1/4" diskette \$2.79 each

For IBM, Apple, TRS and 97% of popular microcomputers.

### What about quality and reliability?

At Beck, our success as a diskette manufacturer depends upon our ability to provide you with a fully reliable, quality diskette – every time. For that reason we take no shortcuts. You get the best because we are committed to excellence. Every diskette is manufactured to very strict quality standards. We test and retest 21 times throughout the manufacturing process to insure compliance with no less than 42 rigid specifications. We make sure you get the very best – a 100% certified, 100% error free diskette.

Our satisfaction money-back guarantee and full 7 year warranty are proof of our commitment to excellence and confidence in our product.



(in New Hampshire call 924-3821)

**Door to Door in 48 hrs.**

**Order Now  
Toll Free**



COD'S  
CASH  
ONLY

Corporate Accounts Welcome

# 1-800-BECK MFG

Order Toll Free 1-800-232-5634. Available in 25 pack only, plus freight, Complete with hub reinforcing rings, Tyvek envelopes, color coded user labels, and nonmetallic write protect tabs. All Beck Diskettes meet or exceed ANSI specifications.

*Listing continued*

```

10 REM LOADER MAKER
20 REM SUBU MAGGE
30 REM JANUARY 9, 1984
40 REM ADOPTED FROM JEFFREY A. MILLS
50 REM -----
60 LET DS = CHR$(4)
70 PRINT DS;"OPEN LOADER"
80 PRINT DS;"DELETE LOADER"
90 PRINT DS;"OPEN LOADER"
100 PRINT DS;"WRITE LOADER"
110 PRINT "FP"
120 PRINT "POKE 103,1"
130 PRINT "POKE 104,64"
140 PRINT "POKE 16384,0"
150 PRINT "LOAD STACK ATTACK"
160 PRINT "POKE 105,0"
170 PRINT "POKE 106,8"
180 PRINT "POKE 107,0"
190 PRINT "POKE 108,8"
200 PRINT "POKE 109,0"
210 PRINT "POKE 110,8"
220 PRINT "POKE 111,0"
230 PRINT "POKE 112,32"
240 PRINT "POKE 115,0"
250 PRINT "POKE 116,32"
260 PRINT "RUN"
270 PRINT DS;"CLOSE LOADER"
280 END

```

*Listing 2. Loader Maker.*

needs to block. This would occur if the player alone had three markers in a combination, indicated by an L array value of 3. In such a situation, a remark would be printed.

1650-1820 check to see if the computer alone has two markers in a combination and can place a third. A value of -.6 in the L array indicates this situation.

1840-2140 see if the player has developed two combinations, each with two of only his markers, sharing a common square. The computer would move to that open square and prevent the player from being able to place three markers in two different combinations, as such a situation would lead to a player win on the next move.

2160-2300 check if there are any open squares. If none are found, the game ends in a draw.

2320-2510 select the best possible moves if all the other tests do not yield a good move. These moves are picked from the Y(17) array in a specific order so that the occupied squares are in as many common combinations as possible.

2570-4390 are a subroutine to ready the variables and plot the board (Figure 2). Lines 2810-2940 provide the square numbers that are either good moves or winning combination components.

4410-4470 are a subroutine to draw

```

3410 REM -----
3420 REM NUMBERS
3430 REM "1"
3440 HPLOT 30,12: HPLOT 30,13: HPLOT 31,12: HPLOT 31,13
3450 FOR X = 30 TO 35
3460 HPLOT X,23: HPLOT X,24
3470 NEXT X
3480 FOR X = 11 TO 24
3490 HPLOT 32,X: HPLOT 33,X
3500 NEXT X
3510 REM "2"
3520 FOR X = 56 TO 58
3530 HPLOT 30,X: HPLOT 31,X
3540 NEXT X
3550 HPLOT 31,55: HPLOT 32,56: HPLOT 38,56: HPLOT 37,56
: HPLOT 38,57: HPLOT 39,57: HPLOT 38,55
3560 FOR X = 32 TO 37
3570 HPLOT X,54: HPLOT X,55
3580 NEXT X
3590 HPLOT 30,66 TO 39,57: HPLOT 30,67 TO 39,67: HPLOT
31,66 TO 39,58: HPLOT 30,68 TO 39,68
3600 REM "3"
3610 HPLOT 30,92: HPLOT 30,93: HPLOT 30,100: HPLOT 30,1
01: HPLOT 31,103: HPLOT 32,101: HPLOT 38,93 TO 39,9
3 TO 39,94 TO 38,94: HPLOT 38,102: HPLOT 38,101: HPLOT
37,101: HPLOT 37,100
3620 FOR X = 32 TO 37
3630 HPLOT X,90: HPLOT X,91
3640 NEXT X
3650 FOR X = 91 TO 100 STEP 9
3660 FOR Y = 0 TO 2
3670 HPLOT 31,X + Y
3680 NEXT Y,X
3690 FOR X = 37 TO 39
3700 HPLOT X,92: HPLOT X,95
3710 NEXT X
3720 FOR X = 32 TO 37
3730 HPLOT X,102: HPLOT X,103
3740 NEXT X
3750 FOR X = 98 TO 100
3760 HPLOT 38,X: HPLOT 39,X
3770 NEXT X
3780 FOR X = 33 TO 38
3790 HPLOT X,96: HPLOT X,97
3800 NEXT X
3810 REM "4"
3820 HPLOT 37,126 TO 37,139: HPLOT 36,127 TO 36,139: HPLOT
28,134 TO 36,127: HPLOT 29,135 TO 37,126: HPLOT 29,
134 TO 39,134: HPLOT 29,135 TO 39,135
3830 REM -----
3840 REM "COLUMN"
3850 REM "C"
3860 HPLOT 39,0 TO 41,0: HPLOT 42,1: HPLOT 38,1 TO 38,5
: HPLOT 39,6 TO 41,6: HPLOT 42,5
3870 REM "O"
3880 HPLOT 46,0 TO 48,0: HPLOT 45,1 TO 45,5: HPLOT 46,6
TO 48,6: HPLOT 49,1 TO 49,5
3890 REM "L"
3900 HPLOT 52,0 TO 52,6 TO 55,6
3910 REM "U"
3920 HPLOT 58,0 TO 58,5: HPLOT 59,6 TO 61,6: HPLOT 62,0
TO 62,5
3930 REM "M"
3940 HPLOT 65,6 TO 65,0 TO 67,3 TO 69,0 TO 69,6
3950 REM "N"
3960 HPLOT 72,6 TO 72,0: HPLOT 72,1 TO 76,5: HPLOT 76,6
TO 76,0
3970 REM ":" 
3980 HPLOT 79,2: HPLOT 79,4
3990 REM -----
4000 REM NUMBERS
4010 REM "1"
4020 LET X = 0:Y = 0
4030 FOR S = 1 TO 2
4040 HPLOT 96 + X,Y TO 96 + X,6 + Y: HPLOT 95 + X,1 + Y
: HPLOT 94 + X,6 + Y TO 97 + X,6 + Y
4050 LET X = 122:Y = 9
4060 NEXT S
4070 REM "2"
4080 LET X = 0:Y = 0

```

*Listing continued.*

*Listing continued.*

```

4090 FOR S = 1 TO 2
4100 HPLOT 125 + X,Y TO 127 + X,Y: HPLOT 124 + X,1 + Y:
    HPLOT 128 + X,1 + Y TO 128 + X,2 + Y: HPLOT 127 +
    X,3 + Y: HPLOT 126 + X,4 + Y: HPLOT 125 + X,4 + Y: HPLOT
    124 + X,5 + Y: HPLOT 123 + X,6 + Y TO 128 + X,6 + Y
4110 LET X = 85:Y = 17
4120 NEXT S
4130 REM "3"
4140 LET X = 0:Y = 0
4150 FOR S = 1 TO 2
4160 HPLOT 156 + X,Y TO 160 + X,Y: HPLOT 160 + X,1 + Y:
    HPLOT 159 + X,2 + Y: HPLOT 158 + X,3 + Y: HPLOT 15
    9 + X,4 + Y: HPLOT 160 + X,5 + Y: HPLOT 159 + X,6 +
    Y TO 157 + X,6 + Y: HPLOT 156 + X,5 + Y
4170 LET X = 44:Y = 26
4180 NEXT S
4190 REM "4"
4200 LET X = 0:Y = 0
4210 FOR S = 1 TO 2
4220 HPLOT 192 + X,Y TO 192 + X,6 + Y: HPLOT 192 + X,Y TO
    189 + X,3 + Y: HPLOT 188 + X,4 + Y TO 193 + X,4 + Y
    : HPLOT 188 + X,3 + Y
4230 LET X = 3:Y = 33
4240 NEXT S
4250 REM -----
4260 REM "ROW"
4270 REM "R"
4280 HPLOT 224,30 TO 227,30: HPLOT 228,31 TO 228,32: HPLOT
    227,33 TO 224,33: HPLOT 224,30 TO 224,36: HPLOT 226
    ,34 TO 228,36
4290 REM "O"
4300 HPLOT 233,20 TO 235,20: HPLOT 236,21 TO 236,25: HPLOT
    235,26 TO 233,26: HPLOT 232,25 TO 232,21
4310 REM "W"
4320 HPLOT 245,11 TO 245,17: HPLOT 244,16: HPLOT 243,15
    : HPLOT 242,16: HPLOT 241,17 TO 241,11
4330 REM ENTER HI-RES WITHOUT ERASING IMAGE
4340 POKE - 16304,0
4350 POKE - 16297,0
4360 POKE - 16301,0
4370 POKE - 16300,0
4380 VTAB 21
4390 RETURN
4400 REM -----
4410 REM SUBROUTINE TO DRAW MOVE
4420 FOR X = 1 TO 7
4430 XDRAW D AT 92 - (B - 1) * 7 + 32 * (C - 1),13 + (A
    - 1) * 39 + (B - 1) * 7
4440 FOR PAUSE = 1 TO 100: NEXT PAUSE
4450 NEXT X
4460 DRAW D AT 92 - (B - 1) * 7 + 32 * (C - 1),13 + (A -
    1) * 39 + (B - 1) * 7
4470 RETURN
4480 REM -----
4490 REM SUBROUTINE TO CHANGE SQUARE NUMBER TO LEV,ROW
    ,COL
4500 LET A = INT ((M(G,J) - 1) / 16) + 1
4510 LET B = INT (((M(G,J) - 16 * (A - 1)) - 1) / 4) +
    1
4520 LET C = M(G,J) - (A - 1) * 16 - (B - 1) * 4
4530 RETURN
4540 REM -----
4550 REM SUBROUTINE FOR BELL
4560 FOR X = 1 TO 5
4570 PRINT CHR$(7)
4580 NEXT X
4590 RETURN
4600 REM -----
4610 END

```

6EDD-	02	00	20					
6EE0-	00	3C	00	56	00	58	00	5A
6EE8-	00	5C	00	5E	00	60	00	62
6EF0-	00	64	00	66	00	68	00	6A
6EF8-	00	05	00	05	00	1B	C1	51
6F00-	1B	C1	28	2D	35	35	3E	3E
6F08-	3F	27	27	2C	2D	2D	26	17
6F10-	3E	27	7F	09	4D	49	C9	00
6F18-	00	2C	25	2D	2C	AD	D2	DB
6F20-	DB	3B	3E	37	3F	07	C1	C1
6F28-	C1	C1	C1	49	35	35	75	2A
6F30-	2E	35	00	05	00	05	00	05
6F38-	00	05	00	05	00	05	00	05
6F40-	00	05	00	05	00	05	00	05
6F48-	05	00	05	00	05	00	05	00
6F50-	05	00	05	00	05	C1	C9	6B
6F58-	09	C1	C8	4D	FF			

*Listing 3. Shape table.*

the moves. A shape table is used for the markers. Shape number 1 is the player's O while the computer's X is shape number 2.

4490-4530 are a subroutine to find a square number's level, row, and column. The player uses this second method to enter his moves.

4550-4590 are a subroutine to sound a bell to gain the player's attention to messages.

### Problems Encountered

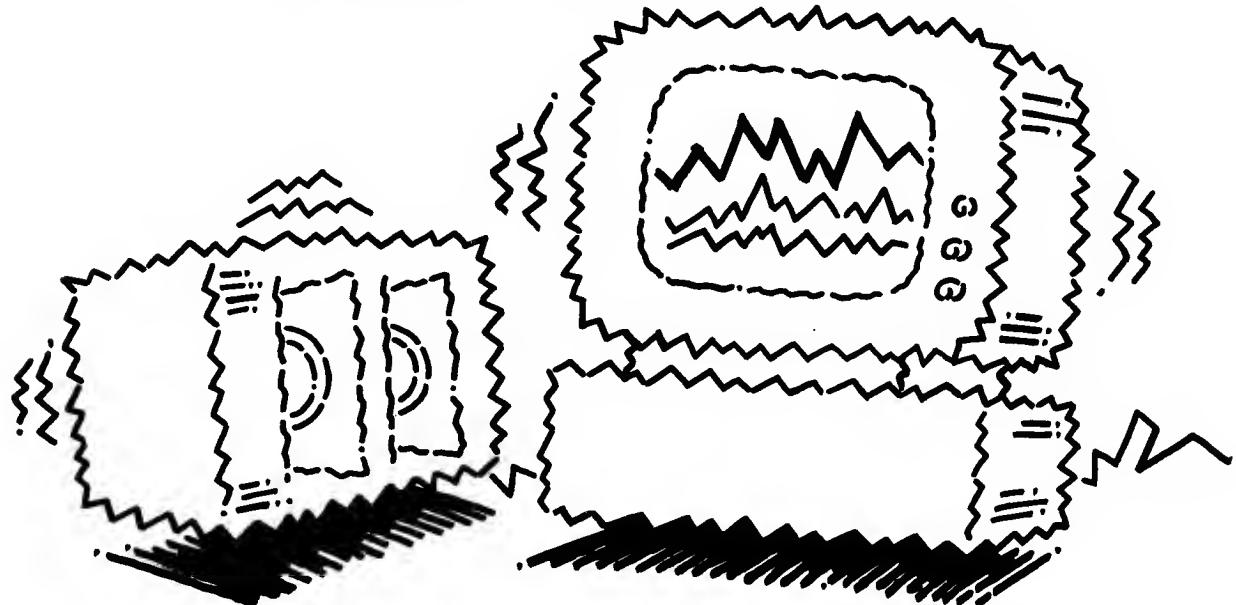
The major difficulty in constructing this program was the incompatibility of long programs with hi-res graphics. As the program grew, it began to occupy the graphics portion of memory and scramble the hi-res board. Avoiding the hassles of monitor fiddling, I originally broke the game down into several small programs that ran sequentially.

Jeffrey A. Mills provided a solution by developing a series of POKEs to load a program above the graphics pages ("Program Loader," *inCider*, September 1983). Adapting his techniques, I wrote Loader Maker (Listing 2), which must be run before all else to create a text file that will run the game properly.

### Getting Started

First, run the program Loader Maker (Listing 2) to create a text file to start the game. Next, type in and save the shape table (Listing 3) with BSAVE SHAPES. A28381,L127. Type in and save the main program as "Stack Attack." Finally, EXEC Loader and enjoy the program. ■

# ELECTRICAL SURGES AND SPIKES CAN BE A REAL SHOCK TO YOUR SYSTEM.



## PROTECT IT FROM CRASHES AND GLITCHES WITH SCOOTER™ GUARD-IT™ CONTROL CENTERS.

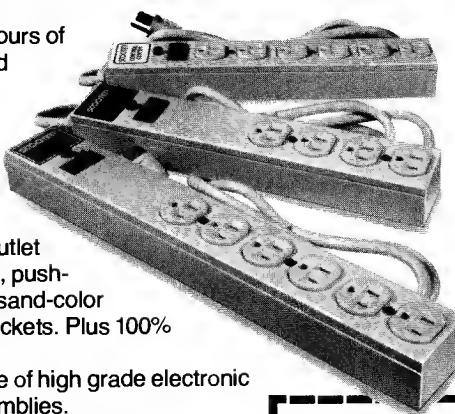
Surges and spikes can wipe out hours of data entry. Damage micro circuitry. And drive you crazy. All in a micro-second.

Protect your data, your computer and your peace of mind with a SCOOTER™ GUARD-IT™ CONTROL CENTER, surge protected outlet strip.

Designed for microcomputers, monitors and printers, all SCOOTER outlet strips feature one-switch power control, push-to-reset circuit breakers and attractive sand-color metal case with matching cable and sockets. Plus 100% factory testing.

And they're just part of a whole line of high grade electronic components and computer cable assemblies.

Ask for SCOOTER Power Control Centers wherever you buy computer supplies. And get surges and spikes out of your system for good.



### EXTENDED PROTECTION: SCOOTER's XP4 GUARD-IT™ CONTROL CENTER

Featuring noise filter, normal and common mode improved surge protection, fail safe design (blocks power if filter fails.) 3-Yr. warranty. **\$74.95**

SP6 GUARD-IT™ CONTROL CENTER  
6 protected outlets, normal and common mode surge suppression. **\$49.95**

\*SC6 SCOOTER™ CONTROL CENTER  
6-outlet power strip. **\$27.95**

\*SC4 SCOOTER™ CONTROL CENTER  
4-outlet power strip. **\$25.95**

\*For all applications that do not require surge protection.  
All prices suggested retail.  
Visa and MasterCard accepted.

### FREE SCOOTER T-SHIRT WHEN YOU BUY ANY SCOOTER CONTROL CENTER

Send us your SALES RECEIPT OR your ORDER with this coupon to:  
ohm/electronics, 746 Vermont St., Palatine IL 60067  
(Illinois residents, when ordering, add 7% sales tax.)

Visa       MasterCard       Check or Money Order

Model #: \_\_\_\_\_ Price: \_\_\_\_\_ T-Shirt Size: \_\_\_\_\_

Card #: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

I-0584



**SCOOTER**  
High Grade Electronic Components

ohm/electronics  
746 Vermont • Palatine, IL 60067  
(312) 359-6040

# The World's Cheapest Word Processor

Believe it or not, with the UCSD Pascal system on your Apple you almost have a built-in word processor. All you need to add is a printout formatter—and here it is!

---

by James R. Florini

---

There are many word processors on the market, some of them very good indeed. However, if you have the Apple Pascal system, you don't really need to buy a word processing package at all.

If you have used Pascal for programming, you must have noticed the convenient features the Editor provides. It has Insert, Delete, Find, and Replace functions (and Replace can be done once, a specified number of times, and globally), re-margining of paragraphs, methods for moving blocks of text within a file and between files, and ways to reconfigure the editing system using the "Set Environment" commands. Careful reading of pages 72-126 in the *Operating System Reference Manual* will introduce you to what the Editor can do. Indeed, it has most of the features of the editors included in the commercial word processing programs, and it is all part of the Apple Pascal System most of us bought for programming.

What the Editor lacks is any provision for printing out the textfiles. At the most elementary level, you can go to the filer and transfer the file to the printer, but that gives unformatted printouts. What is needed is a program to make the text print the way you want it to—a printout formatter.

I started working on this printout formatter when I recognized the *single great truth* of text formatting—that the computer need not send to the printer each character it reads from a

textfield. This means that you can use various characters as signals to have the printer take some specific action (printing the next character as a superscript, for example). Everything else is just a matter of deciding what features to include, what signals to use for them, and writing the procedures and functions to make it all work.

One advantage to using the UCSD Pascal system for word processing is the possibility of analyzing the textfiles with programs like my REFCITED (*inCider*, March 1983), which pulls all reference citations from the text. The CROSSREF program that is included in the Pascal package (on disk Apple 3:) can check spelling and be used as a rather crude indexer. Another advantage is that you can customize things to fit your own needs using a program like the one presented here. The major disadvantage I see is that the operating system is not really very user-friendly; certainly it doesn't provide as many on-screen prompts as most commercial word processors. But when you finally get familiar with them, those single-letter commands in the UCSD system are really very quick and easy to use.

I have written this program on the assumption that it will be used for serious word processing, so things are arranged for at least two disk drives, 80 columns and a full ASCII character set. Many modifications of the older Apple II's provide these, and the IIe comes with a full ASCII character set, at least 64K of memory, and a stan-

dard typewriter keyboard. (It seems to me that anyone doing word processing with a 40-column Apple II would be wiser to use a commercial program like Screenwriter II, rather than put up with all of the dizzying horizontal scrolling involved in using the Apple Pascal Editor on a 40-column screen).

I have also assumed the use of a Diablo-type printer, although it is essential only for the boldface and superscript functions; these require very short horizontal spacing and negative linefeeds, respectively. Otherwise, everything in this program should work on most printers—if you can find the appropriate control codes in your printer manual.

## Entering the Text

Obviously, a printout formatting program is not very useful if you have nothing to be printed. To help you decide if it is worthwhile to go to the trouble of typing and compiling this long program, let's first go through the steps used in entering text with this system.

First, go to the filer and enter N for a new file. Then quit the filer, enter E to get the editor, and press return in response to the request for a file name. Now, assuming you are going to enter things in normal paragraph format, enter S and E to set the environment. In

---

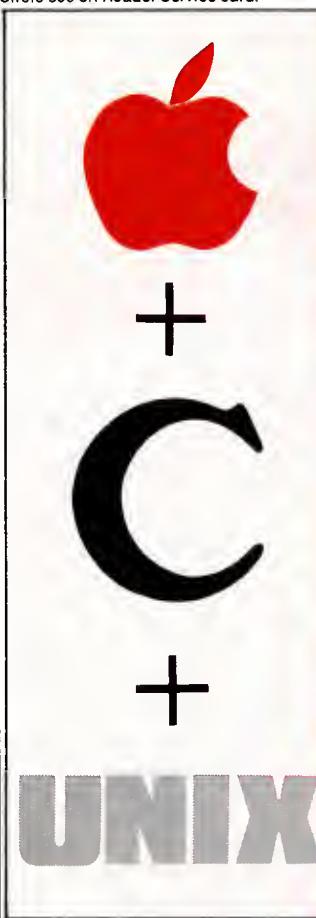
Write to Dr. James R. Florini, c/o Biology Department, Syracuse University, Syracuse, NY 13210.

response to the resulting menu, enter AFFT for auto-indent false and filling true. Also enter C' to make the command character the accent grave (ASCII character #96). The command character's function in the UCSD editor may not be obvious, but it's very handy. If it is the first character in a line, it prevents that line from being incorporated into a paragraph when you use the margin command or insert something just ahead of that line. It is particularly useful for the command lines we'll get to in a moment.

Now press the spacebar to get back to the editor, and then enter I to start inserting text. All you have to do now is just type away as fast as you can—and for me it is a good deal faster on the Apple than on a typewriter, possibly because it is so easy to correct mistakes that I don't worry much about them. Don't bother with carriage returns unless you want to start a new paragraph (two successive returns do this); the text wraps around to the next line without breaking up your words. Clever little Apple!

None of this says anything about the accompanying program or its features, so let's stop typing a moment to look at the kinds of signals we might include in the text. They are all listed in Table 1. Embedded signals occur within a line and affect only the immediately following character (or in the case of underline, start and stop within a line). Command lines make more permanent changes and must appear on a line by themselves. For the latter, to make things easier for people accustomed to other word processors, I have used command lines starting with periods; this is a rather common way of putting commands in text files. To make things as user-friendly as possible, I have tried to use very descriptive commands, and have allowed the option of using either a long, descriptive format or an abbreviated version (handy when you get more accustomed to the system). Of course, the nice thing about an open program of this sort is that you can make up your own commands, change the command letters—do anything that fits your needs.

To show how these things might be used, Figure 1 shows a short paragraph with all the signals showing (I



**AZTEC C65**

A POWERFUL, PROFESSIONAL, AND PORTABLE "C" LANGUAGE DEVELOPMENT SYSTEM FOR APPLE COMPUTERS

AZTEC C65 brings all the power of "C" to the APPLE II and APPLE IIe. The AZTEC C65 "C" compiler generates fast 6502 assembler code. Runtime support includes full UNIX IO general utility functions, scientific math functions, overlay support, and device driver interfaces.

AZTEC C65 is a professional development system. It includes APPLE SHELL — a UNIX like development environment. VED — a full screen editor. AS65 — a

**PRICES**

AZTEC C65 - APPLE DOS 3.3	\$199
PC DOS, MS DOS, CP/M-86, CP/M-80 TO 6502 CROSS	\$750
UNIX TO 6502 CROSS (PDP-11)	\$2000
"C" TUTORIAL SYSTEM (upgradable to full AZTEC C65)	\$95
AZTEC C65 MANUAL	\$35
AZTEC C65 without manual	\$169
AZTEC CII for CP/M-80 (MP/M-80)	\$199
AZTEC C86 for PC DOS, MS DOS, or CP/M-86	\$249

**MANX**  
software systems

Call for information on AZTEC C65 for ProDOS and other 6502 systems.

**ORDER BY PHONE OR MAIL — DEALER INQUIRIES INVITED**

MANX SOFTWARE SYSTEMS  
BOX 55, SHREWSBURY, NJ 07701  
Order Phone: 800-221-0440  
Information and NJ Orders 201-780-4004  
Telex: 4995812

## PROTECTING YOUR APPLE . . . AN OPEN AND SHUT CASE



**apple CENTER**

The APPLE-CENTER Model 12 protects your Apple system from theft and unauthorized use. All metal construction, the APPLE-CENTER bolts easily to a table-top, securing your Apple II or IIe, 2 disk drives and your monitor. Unlocked, the APPLE-CENTER



opens up to allow you quick and easy access inside your Apple. The key switches power to your Apple system and the filtered cooling fan. The SURGE SENTRY, by RKS Industries, protects your Apple from harmful voltage spikes.



Rear Cooling Fan



Our Model 10

Call or write  
for additional information:

**DOSS INDUSTRIES**

1224 Mariposa  
San Francisco, CA 94107  
(415) 861-2223

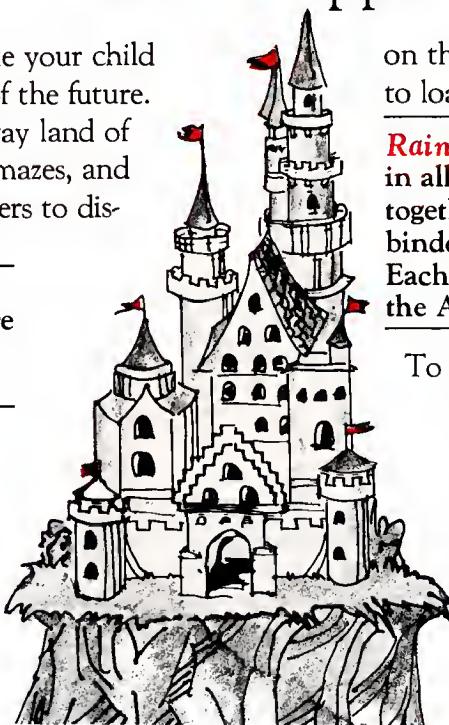
# Send Your Child on the Rainbow Quest.

## Fiction, Fantasy, and Computer Adventure for the Apple

**R**ainbow Quest will take your child on a space adventure of the future. The planet Rainbow is a faraway land of ancient and mysterious cities, mazes, and puzzling events for young readers to discover.

**Rainbow Quest** by Richard Ramella is a book-and-software adventure for the Apple II, II+, and IIE.

Children read and play along as Molly and Sam meet pirates, robots, and strange creatures as they make their way across the planet Rainbow. To reach their goal, they must survive on their own and face the challenges they meet along the way. Readers will help Molly and Sam find their way through dark and confusing mazes, solve word and number puzzles, and conquer invaders in arcade-style games. Each obstacle they meet is a program,



on the **Rainbow Quest** software, ready to load and run.

**Rainbow Quest** has 25 programs in all. Book and software are sold together in a protective storage binder with complete instructions. Each **Rainbow Quest** package for the Apple is \$24.95.

To order **Rainbow Quest**, call toll-free for credit card orders,

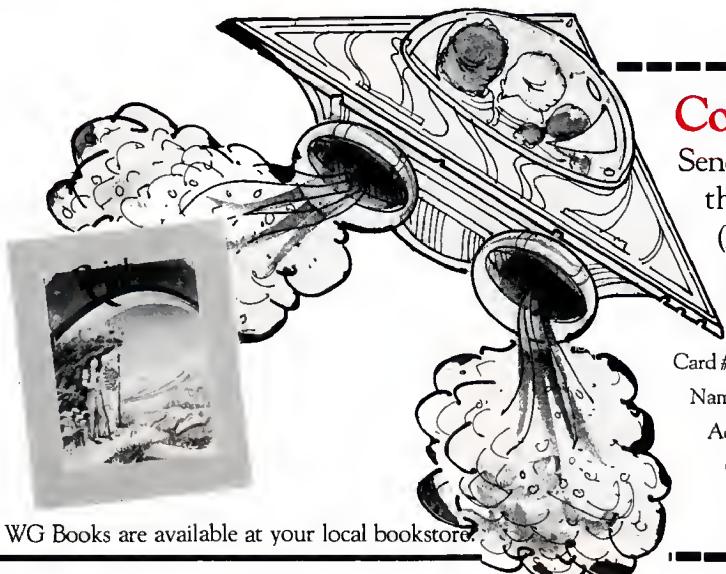
1-800-258-5473. (In New

Hampshire, call 924-9471.) Or mail your order with payment or complete credit card information to: Wayne Green Inc., Attn. Book Sales, Peterborough, NH 03458. Allow 4-6 weeks for delivery. Orders payable in US dollars only.

**Rainbow Quest** by Richard Ramella. Programs adapted for the Apple by Warren Witherell. Illustrated by Coni Porter. \$24.95, 7 by 9 book, softcover, spiral-bound, 128 pp.

Disk version CC7407

ISBN 0-88006-082-4 Available in April  
Dealer inquiries invited.



### Color my child's imagination!

Send me \_\_\_\_\_ copies of **Rainbow Quest** for the **Apple** (CC7407) at \$24.95 per package. (Include \$2.00 per package for shipping and handling.)  Payment Enclosed  MasterCard  VISA  AMEX

Card # \_\_\_\_\_ MC Bank # \_\_\_\_\_ Exp. date \_\_\_\_\_

Name \_\_\_\_\_ Signature \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Wayne Green Books, Peterborough, NH 03458

345B5Q

Set Spacing at 1  
 Print Boldface  
 Don't Print unless at least 3 lines left on the page  
 Example of Text Entry

This is an example of the kind of text one would enter to be formatted with the \_DIABLOPR1; program. We get underlining like this, and can also do footnotes with superscripted key letters as shown here. Chemists would start Footnote

a This is an example of the way you would put a footnote in the text. It can, as you see, occupy more than one line, and it can include any (or all) of the usual imbedded signals.

End Footnote

also use subscripts to write something like H<sub>2</sub>SO<sub>4</sub>. Now I'll change the Environment.

What I did here was to change the left, right, and paragraph settings. Word processors often do that with command lines, but that would require that the program include procedures to format lines. I think it is preferable (insofar as possible) to see how the final printout will look while entering the text.

Back to normal now.

*Figure 1. Sample text as it is entered.*

#### *Listing 1. DIABLOPR1.*

```
(**$+,V-*)
PROGRAM DIABLOPR1;
  (BY J. R. FLORINI, Biology Dept., Syracuse University)
  (USES ENTRIES; - if you have this in your SYSTEM LIBRARY)
CONST
  PAGELEN=66; {66 lines/11 inch page at normal spacing}
  SPACE=' '; NULL=''; {Makes program easier to read}
  NORMAL=B; PARTIAL=3; REMAINDER=5; {Diablo vertical space settings}
  MAXFILES=15; MAXFOOT=75; DATE='10/10/83';
TYPE RIGHTONES=SET OF CHAR; {Omit if USES ENTRIES}
VAR
  FILEPRINT, PRINNUM, PAUSE, INSAVED, FINISHED, ALLDONE, UNDERLINE, NEWPAGE,
  INCLUDING, FORMATTING, HALF, PART, UNDERSPACE, PLUSMINUS, PRINTBOLD,
  FOOTPRINT: BOOLEAN;
  CHOICE: CHAR;
  COMMANDSET: SET OF CHAR;
  HEADPLACE, PAGEPLACE, LINES, LINESPACE, MARGINS, PAGE, J, U,
  TOTFILES, WORDS, FLINES, SLINES: INTEGER;
  SAVESPACE: PACKED ARRAY[0..10] OF INTEGER;
  FIRSTPAGE: PACKED ARRAY [0..MAXFILES] OF INTEGER;
  PRINTPAGE: STRING[4];
  RUNHEAD: STRING[75];
  INFILE, LINE: STRING;
  FILENAME: ARRAY [0..MAXFILES] OF STRING[20];
  FSTRING: ARRAY[1..MAXFOOT] OF STRING;
  INCLFILE, TEXTFILE, DIABLO: TEXT;

PROCEDURE CLEAR_SCREEN;
BEGIN
  WRITE(CHR(12)); {Clears screen}
  WRITELN('MEMORY AVAILABLE IS :35, MEMAVAIL, ' WORDS.', DATE:15);
  WRITELN; WRITELN
END;

PROCEDURE CLEAR_LINE(N: INTEGER);
BEGIN
  GOTOXY(0,N); WRITE(CHR(29));
END;

PROCEDURE CLEAR_BOTTOM;
VAR I: INTEGER;
BEGIN
  FOR I:=23 DOWNTO 20 DO CLEAR_LINE(I);
END;

PROCEDURE ZERO_FOOT;
VAR I: INTEGER;
BEGIN
  FOR I:=1 TO MAXFOOT DO FSTRING[I]:=NULL;
  FLINES:=0; FOOTPRINT:=FALSE;
END;

PROCEDURE SHOW_LINE;
BEGIN
  GOTOXY(32,20); WRITE(WORDS,' Words');
  GOTOXY(45,20); WRITE('LINE # ',LINES+1);
  GOTOXY(60,20); WRITE(FLINES,' Footnote Lines');
  CLEAR_LINE(22); WRITE(LINE); GOTOXY(B0,23);
END;

PROCEDURE REMOVE_GRAVE;
BEGIN
  IF LENGTH(LINE)>0 THEN IF LINE[1]='`' THEN DELETE(LINE,1,1); {Remove `}
END;

PROCEDURE INCL_LINE;
```

*Listing continued.*

\$50

# STUDENT STATISTICS

Are you tired of doing statistics problems on a calculator?

Use **HSD STATS™** on an Apple II/Ile and make your life easier. You can read the manual first or just boot the program disk and make your choices from the screen menu.

#### DATA FILES

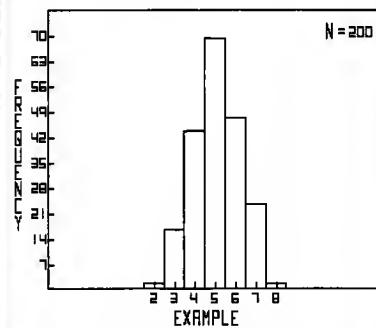
Save your data to disk files for later use, join data files, and transform data.

#### ANALYSES

Get means and standard deviations, z-scores, frequency distributions with bargraphs, chi-squares, Pearson correlations, linear regressions, scatterplots, and 3 t-tests.

#### OUTPUT

Obtain test results with p-values on monitor or printer.



Researchers at leading universities and medical centers have used **HSD STATS™** for years. They paid \$99.95, but now you can get the complete program package for only \$50.

Save time and aggravation. Use **HSD STATS™** from Human Systems Dynamics, publishers of The Statistics Series™, sophisticated statistics programs for professionals.

**HSD STATS™** comes with a 10 day money back guarantee.

Apple II, 48K, 1 or 2 Drives, ROM Applesoft.



HUMAN SYSTEMS DYNAMICS

To Order— Call (818) 886-4281  
 or Write

HUMAN SYSTEMS DYNAMICS  
 9010 Reseda Blvd. Suite 222/Dept.C  
 Northridge, CA 91324



Dealer Inquiries Invited



#### Example of Text Entry

This is an example of the kind of text one would enter to be formatted with the DIABLOPRT program. We get underlining like this, and can also do footnotes with superscripted key letters as shown here. Chemists would also use subscripts to write something like H<sub>2</sub>SO<sub>4</sub>. Now I'll change the Environment.

What I did here was to change the left, right, and paragraph settings. Word processors often do that with command lines, but that would require that the program include procedures to format lines. I think it is preferable (insofar as possible) to see how the final printout will look while entering the text. Back to normal now.

<sup>a</sup> This is an example of the way you would put a footnote in the text. It can, as you see, occupy more than one line, and it can include any (or all) of the usual imbedded signals.

Figure 2. Sample text output.

added the Print Signals and Don't Print Signals commands to let my printer do this). In essence (except for odd things like footnotes and command lines), the text looks a lot like it will on the final printout—except, of course, that you can see only 24 lines at a time. Figure 2 shows the output from this paragraph.

#### How It Works

If you haven't seen many Pascal programs, you may not know that they should be read backwards; to find out what is happening, start with the "Main Program," which is required to be at the end; look up the procedures as they are called. To help you read my

programs, I designate all procedures (and most functions) with two words separated by an underline, and I make the variable names as descriptive as I can.

In this program, we start with some instructions (lots of different people might use it), and then do a bunch of initializing things while the user is reading the instructions. The user gets a chance to enter a running title for the top of each page, or to enter F so the name of each file will be printed there (this is handy when correcting drafts of long documents consisting of a number of files).

The next procedures, STANDARD\_FORM and CHOOSE\_FILES, may seem a bit strange. They are temporary expedients to keep this program from filling an entire issue of *inCider*. This month's version of the program prints everything single-spaced, with one-inch margins, and the pages numbered at the upper right. It also prints just one file, so TOT\_FILES is (temporarily) set at 1, and the filename must be entered exactly. Next month I'll present rather fancy versions of STANDARD\_FORM and CHOOSE\_FILES that will give lots of formatting options, add the .TEXT suffix, make sure the files are really present, make the computer look in every possible drive for any file specified, and even show you a disk directory if you can't remember the name you gave a file. That's really user-friendly!

Now the program goes on to print the files (all one of them, this month!) in order. First there is some screen business that will look a bit odd now, but will make more sense next month when there is a list of filenames at the top of the screen. Of course, the list of starting page numbers hasn't been entered yet, but it is easier to put these things in the program now than to make a lot of little changes when we include the file entry parts next month. The important thing here is the call to READ\_FILE; that's where the action really starts.

READ\_FILE reads through the file, one line at a time, by calling NEXT\_LINE, which uses SHOW\_LINE to flash each line as it is read (and to show how many words and lines have been printed). PROCESS\_LINE is then in-

Circle 355 on Reader Service card.

Before you buy a speech synthesizer, listen to the ECHO II. It is the most versatile, intelligible and economical speech product.

Check it out at your local dealer.

Street Electronics Corporation  
1140 Mark Avenue Carpinteria, CA  
93013 Telephone (805) 684-4593

*Listing continued.*

```

BEGIN
  READLN (INCLFILE,LINE); REMDVE_GRAVE;
END;

PROCEDURE NEXT_LINE;
BEGIN
  READLN (TEXTFILE,LINE); SHDW_LINE; REMDVE_GRAVE;
END;

PROCEDURE PAPER_INSERT; {Single sheet feed}
BEGIN
  CLEAR_BDTDM; IF FINISHED THEN WRITELN ('Insert paper to START file',
  FILENAME[J], ' on page ',page,'.') ELSE IF PAGE > 1 THEN
  BEGIN
    WRITELN ('Insert paper and align top edge for page ',PAGE,' of file ',
    FILENAME [JJ],'.');
    WRITELN ('PRESS <RETURN> TO CONTINUE PRINTING.':35); WRITE (CHR(7));
    READLN;
  END;
END;

PROCEDURE CHECK_STDRED; {Leave space at top for graph}
VAR I, AVAILABLE; INTEGER;
BEGIN
  AVAILABLE:=PAGELEN - 2 * MARGINS;
  REPEAT {Might be more than one waiting}
    IF (SAVE_SPACES[I]<>0) AND (SAVESPACE[I] <= AVAILABLE) THEN
    BEGIN
      FDR I:=1 TD SAVESPACE[I] DD WRITELN(DIABLD);
      LINES:=LINES+SAVESPACE[I];
      FDR I:=1 TD 9 DD SAVESPACE[I]:=SAVESPACE[I+1];
    END;
    UNTIL (SAVE_SPACES[I]=0) OR (LINES+SAVESPACE[I] > AVAILABLE);
END; {CHECK-STORED}

PROCEDURE PRDCESS_LINE; FDRWARD;

PROCEDURE PRINT_INCLFILE;
BEGIN
  INCLUDING:=TRUE; GDTDXY(0,21); WRITE('PRINTING ',INFILE);
  RESET(INCLFILE,INFILE); WHILE NDT EDF(INCLFILE) DD
  BEGIN
    INCL_LINE; SHDW_LINE; PRDCESS_LINE;
  END;
  CLOSE(INCLFILE); INSAVED:=FALSE; INCLUDING:=FALSE;
  GDTDXY(0,21); WRITE(CHR(29));

```

*Listing continued.*

voked to check if either of the signals to turn on formatting is present. If it is (or if formatting has not been turned off), the huge PRINT\_LINE set of procedures is called to do all the formatting that can be done; otherwise PRINT\_UNCHANGED just prints the line as it was read from the file. This non-format option may seem odd, but it can be quite useful for printing out programs and for similar situations in which you don't want superscripts, subscripts, etc. This gives slightly greater speed, of course, but in most cases it is the printer rather than the Pascal program that limits output speed.

PRINT\_LINE is, as you can see, by far the biggest part of this big program. To save time, the first thing it does is to look for (and print) empty lines. (This part includes a half-space feature I use to compress bibliographies without making them less readable.) Then it calls CHECK\_SIGNALS to see if any command lines, superscripts, or subscripts are present. If a line starts with a period, READ\_COMMAND calls GET\_CAPS to condense the command line to its capital letters and then plows through a bunch of nested case statements to make the appropriate response to the command line. This is the place where you can make up more commands to fit your own needs. The possibilities are limited only by your imagination; the current version of this program leaves plenty of memory available for additional features. Some of my commands seem a bit unlikely; I don't know of many cases in which you might start or stop numbering pages in the middle of a manuscript, but it was so easy to do that I couldn't resist adding the commands.

By using .Include File "#5:Table1.text" as a command, you can insert another file within the printout, and have it appear at the top of the next page if there isn't room on the current page; this is the way you might include tables within a report, for instance. If you want it printed at the point it is called, just change the command to .Include File Immediately "#5:table1.text" and the new file will start on the next line. It can include all the features (except another include-

## Business as Usual?

Business as usual these days means a computer that's up and "humming." But if your computer were stolen or damaged, you wouldn't have business as usual.

YOU'D HAVE TROUBLE!

You can get fast replacement for your entire system and be back in business in a hurry by protecting your computer with SAFEWARE Personal Computer Insurance. It's the only coverage designed specifically for personal computers used for business — in your office, shop or home.

SAFEWARE protects ALL hardware, ALL purchased software and ALL media against theft, damage or any other kind of loss, regardless of use, after a low \$50 deductible.

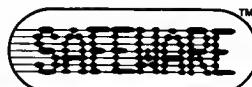
*(Not without  
your computer  
it wouldn't be.)*

Fast, courteous claims handling prevents your losing valuable business computing time.

Find the premium price for the coverage you need listed in the table below, *available for as low as \$35 per year*. Fill in the coupon today. Your coverage will begin as soon as your coupon application is received. Or for even faster coverage, call our toll free number:

**1-800-848-3469**

*(In Ohio call 1-614/262-0559)  
Phones open 8 a.m. to 8 p.m.  
Monday through Saturday*



Mail to: SAFEWARE, P.O. Box 02211, Columbus, OH 43202.

### Before I'm out of business,

please issue my SAFEWARE Insurance Coverage.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

System value \$ \_\_\_\_\_  Check Enclosed  VISA  MasterCard

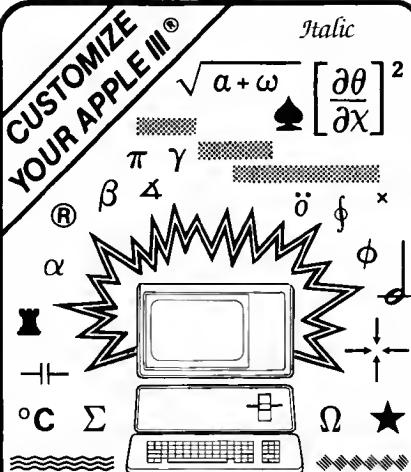
Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

*Call toll-free for rates on higher coverage.*

*Coverage differs in Texas.*

*It is an underwriting requirement that you insure your system for its full value.*

IC



with —

## CustomFONT

**Character, Symbol, and Font Design  
for your Apple III and Graphics Printer**

Design, display and print special characters, symbols, logos, formulae, graphics, and special fonts in word processing and spreadsheets • Enhance your own programs and games with flashing characters, unique displays, and distinctive reports • Built-in fontfile utilities and character set printouts • Fully documented and fun to use • Extends the capabilities of your Apple III and graphics printer 1000 percent! • Requires 256k and Epson, IDS 4/560, Prism, Prowriter, or Apple DMP.

Only \$149.00. Send check or money order to:

**Swenson**  
The Solution Company

SWENSON ASSOCIATES, INC.  
45 Newbury Street  
Boston, MA 02116  
(617) 267-3632

**FREE  
Demo Disk!**



- Please send CustomFONT (payment enclosed)
- Please send more information and Demo Disk

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

**Dealer inquiries welcome**

(Massachusetts residents add 5% sales tax)

"EMBEDDED" COMMANDS (i.e., may appear anywhere within the text):

' - next character (one character only) printed as a superscript  
\ - next character (one character only) printed as a subscript  
- start underlining (everything except spaces; stops after 160 chars)  
T - stop underlining  
~ - print a space (to get more than one in a row)  
` - not printed; use as a "Command" character when setting Environment

COMMAND LINES - MUST be at the left edge of the text, although the period can be preceded by the ` command character. No text that is to be printed can be on the same line. Command lines can be anywhere in the text. All commands except those related to footnotes take effect immediately. Embedded commands (but NOT Command Lines) can appear within footnotes. "n" can be any integer you want, and it can appear anywhere in the line.

Short Form	Longer Equivalent	Effect on Printout
.FP* or .DS	.Format Printout .Don't print Signals	Prints formatted output; this is the usual mode
.DF or .PS	.Don't Format .Print Signals	Prints everything with no formatting; shows all signals
.C or .P	.Change typeface .Page	Stops output until you hit <RET> Starts new page
.DU or .US	.Don't Underline Spaces .Underline Spaces	Obviously Equally obvious
.PM or .NM	.Print plus or Minus .No plus or Minus	Plus signs underlined Plus signs not underlined
.DPn or .SGN or .SCn	.Don't Print unless n lines .Save n inches for Graph (has same affect)	Avoids isolated headings at bottom Makes n-inch space for insertion of a graph (chart) or table
.SF	.Start a Footnote	Saves all lines until next initial dot for printing as a footnote
.EF	.End Footnote	Obviously - any line starting with a period has the same effect
.NNn or .SSn or .HS or .HO or .FS*	.Next Page is number n .Set Spacing at n .Half Spacing .Half spacing On .Full Spacing	Changes page numbers during print Change from single to double, etc. Prints empty lines at half spacing (useful in bibliographies)
.PN* or .DN	.Print page Numbers .Don't Number pages	Start numbering the pages Stop numbering the pages
.PP* or .NP	.Print "Page" .No "Page"	Print "Page" in front of numbers Don't print "Page"
.PB or .PM* or .NM	.Print Boldface .Print plus or Minus .No plus or Minus	Print (only) next line boldface All plus signs underlined Plus signs printed as is
.IF"X"	.Include File "X"	X must be exact name of text file

\* indicates default settings.

Table 1. Commands recognized by the DIABLOPRNT program.

**Listing continued.**

```

GOTOXY(0,23); WRITE(CHR(29));
END;

PROCEDURE TOP_PAGE;
VAR I: INTEGER;
BEGIN
  IF NEWPAGE OR (FINISHED AND (J=TOTFILES)) THEN EXIT(TOP_PAGE);
  NEWPAGE:=TRUE;
  IF PAUSE THEN PAPER_INSERT;
  IF (MARGINS > 2) THEN
    BEGIN
      WRITELN(DIABLO);
      IF (RUNHEAD<>NULL) AND (PAGE>1) THEN
        BEGIN
          IF FILEPRINT AND (PAGEPLACE=38)
            THEN HEADPLACE:=36+ TRUNC(LENGTH(RUNHEAD)/2);
          WRITELN(DIABLO, RUNHEAD:HEADPLACE);
        END ELSE WRITELN(DIABLO);
        IF PRINTNUM AND (PAGE >1)
          THEN WRITELN(DIABLO, PRINTPAGE:PAGEPLACE, ' ', PAGE)
        ELSE WRITELN(DIABLO);
    END;
  IF MARGINS>3 THEN FOR I:=1 TO (MARGINS-3) DO WRITELN(DIABLO);
END ELSE FOR I:=1 TO MARGINS DO WRITELN(DIABLO); LINES:=MARGINS;
  
```

**Listing continued.**

file) that the main file uses.

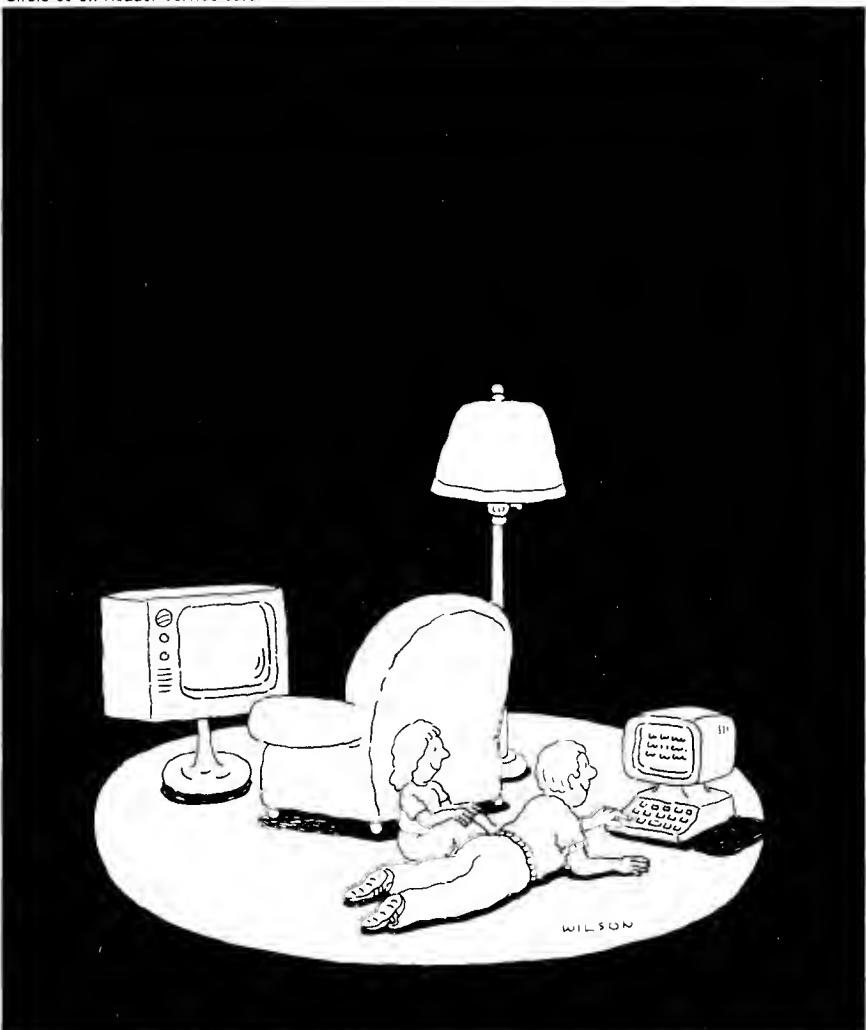
I'm rather fond of the command line system used here; you can make things quite descriptive if you remember which words to capitalize, but you can be starkly brief when you get fully familiar with the system. As shown in Table 1, you can get boldface print by entering (at the left margin) either ".Print Boldface" or ".PB". As the numbers are read separately, it is just as satisfactory to use ".Save 2.75 inches for a Graph" as to write ".SC2.75". There is some redundancy in commands; I had trouble remembering whether the command to leave blank

"Programmers must try to accommodate non-precise commands if computers are to be as useful as they can be for us imprecise humans."

space was "Save for Graph" or "Save for Chart", so I decided to make the two equivalent. Similarly, you might want to turn off formatting in order to print a program (and thus use "Don't Format"), but at other times you could want to print any signals in the textfile (so "Print Signals" would seem more logical). It seems to me that programmers must try to accommodate non-precise commands if computers are to be as useful as they can be for us imprecise humans.

After all the commands are read, the presence of superscripts or subscripts is checked, and all the tildes (the ~ characters) are replaced by spaces; this use of tildes as spaces lets you get more than one space in succession (and avoid two spaces after a period, as when printing Mr. or Mrs. and initials) without having to give up the convenience of automatic filling of paragraphs by the Pascal Editor.

Finally, we go back to PRINT\_LINE and actually start printing the formatted text. First, any superscripts are printed in the appropriate places, and then the main part of the line is



## Complacency or curiosity?

Move your children away from the passive nature of TV viewing and turn them on to the excitement and fun of interactive learning with Dow Jones News/Retrieval®.

With our 20-volume, 30,000 article encyclopedia, Dow Jones News/Retrieval will pique your children's curiosity about the world around them and help them develop new skills. The information they need for school is easy to access, always up-to-date, always ready. And kids love to use it!

Mom and Dad will like Dow Jones News/Retrieval, too! The whole family will enjoy the unique shop-at-home service, movie

reviews, sports and weather. Plus, Dow Jones Current and Historical quotes—continuously monitored for accuracy by our staff—and exclusive electronic access to instant business and financial news from *The Wall Street Journal*, *Barron's*, and the Dow Jones News Service.

Overall, you'll find a wide variety of high quality data bases that are easily and quickly accessible with most personal computers.

To get your children involved, excited and turned on to the fun of learning, turn them on to Dow Jones News/Retrieval.

**DOW JONES**  
**NEWS/RETRIEVAL**®

Copyright © 1984 Dow Jones & Company, Inc. All Rights Reserved.  
Dow Jones News/Retrieval® is a registered trademark of Dow Jones & Company, Inc.

**FOR FULL DETAILS, CALL 800-345-8500, EXT. 5**

Alaska, Hawaii and foreign, call 1-215-789-7008, Ext. 5

*Listing continued.*

```

CHECK_STORED; {Any graph spaces waiting?}
IF INSAVED THEN PRINT_INCLFILE;
CLEAR_BOTTOM; WRITE ('FILE ',FILENAME[J],', PAGE ',PAGE);
PAGE:=PAGE+1; FOOTPRINT:=FALSE;
END; {TOP_PAGE}

PROCEDURE PRINT_FOOT;
VAR I, J, STORESPACE: INTEGER;
BEGIN
  FOOTPRINT:=TRUE; NEWPAGE:=FALSE;
  J:=LINES+F_LINES+2*MARGINS;
  IF J < PAGELEN THEN FOR I:=1 TO PAGELEN-J DO
  BEGIN {Put footnotes at the bottom of the page}
    WRITELN(DIABLO); LINES:=LINES+I;
  END;
  STORESPACE:=LINESPACE; LINESPACE:=1; {Footnotes ALWAYS Single-Spaced}
  WRITELN(DIABLO,'-----'); {Separator - omit it if you prefer}
  LINES:=LINES+I;
  IF (FSTRING[I]<>NULL) AND (FSTRING[I]<>SPACE) THEN
  BEGIN
    WRITELN(DIABLO); LINES:=LINES+I;
  END;
  I:=0;
  REPEAT
    I:=I+1; LINE:=FSTRING[I]; SHOW_LINE; PROCESS_LINE;
  UNTIL (I=F_LINES) OR NOT FOOTPRINT; {Footprint false in TOP_PAGE}
  IF I < F_LINES THEN {Not enough room on current page}
    FOR J:=I TO F_LINES-I DO FSTRING[J]:=FSTRING[I+J]; {Leftover footnote lines}
  LINESPACE:=STORESPACE;
END; {PRINT_FOOT}

PROCEDURE BOTTOM_PAGE;
BEGIN
  IF NEWPAGE THEN EXIT(BOTTOM_PAGE); {Avoid blank pages}
  IF (F_LINES<>0) AND NOT FOOTPRINT THEN PRINT_FOOT;
  WRITE(DIABLO,CHR(12));
  TOP_PAGE;
END; {BOTTOM-PAGE}

PROCEDURE TEST_LINES;
VAR TEST: INTEGER;
BEGIN
  IF F_LINES>>0 THEN TEST:=F_LINES+LINES+1 ELSE TEST:=LINES;
  IF FOOTPRINT THEN TEST:=LINES;
  IF TEST>=(PAGELEN-MARGINS) THEN BOTTOM_PAGE;
END;

PROCEDURE LINE_FEED;
VAR I, TEST: INTEGER;
BEGIN
  LINES:=LINES+I;
  IF FOOTPRINT THEN EXIT (LINE_FEED);
  IF LINESPACE > 1 THEN
  BEGIN
    FOR I:=1 TO LINESPACE-1 DO {One linefeed already in PRINT_LINE}
    BEGIN
      LINES:=LINES+1; WRITELN (DIABLO);
    END;
    END;
    TEST_LINES;
  END; {LINE-FEED}

PROCEDURE WRITE_LINE;
CONST DASHES='-----';
BEGIN
  WRITE (DASHES); WRITELN (DASHES);
END;

{ IF NOT USING "ENTRIES" UNIT, THEN ADD (**I #5:ENTRIES*) HERE}
{**I #5:ENTRIES*}
{**I #5:DIABLO2*} Add this next month - contains several goodies

{The following two procedures will be replaced by larger versions next month}
PROCEDURE CHOOSE_FILES;
BEGIN
  CLEAR_SCREEN; WRITE('Enter the EXACT name of the file to be printed: ');
  READLN(FILENAME[I]); TOTFILES:=I;
END;

PROCEDURE STANDARD_FORM;
BEGIN
  FORMATTING:=TRUE; PLUSMINUS:=TRUE; PRINTNUM:=TRUE;
  PAUSE:=FALSE; UNDERSPACE:=FALSE;
  PAGE:=I; MARGINS:=6; LINESPACE:=1; HEADPLACE:=75; PAGEPLACE:=73;
  PRINTPAGE:='Page';
END;

PROCEDURE GENERAL_INSTR;
BEGIN
  CLEAR_SCREEN;
  WRITELN ('This program allows the user to print Pascal text files from');
  WRITELN ('any drive in any desired order. The boot disk must be');
  WRITELN ('present to START the program, but it can be replaced NOW');
  WRITELN ('with a diskette containing text to be printed.); WRITELN;
END; {GENERAL_INSTRUCTIONS}

PROCEDURE MAKE_SPACING (N: INTEGER); {Check your printer manual for these}
BEGIN {This works on a Diablo or Xerox printer}
  WRITE(DIABLO,CHR(27),CHR(30),CHR(N+1));
END;

PROCEDURE GET_CAPS (VAR S:STRING);
VAR I: INTEGER;
BEGIN

```

*Listing continued.*

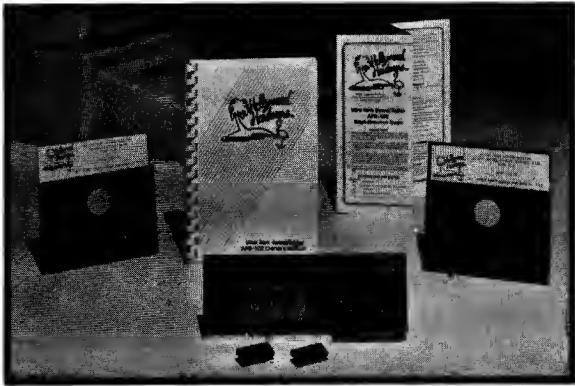
printed. This is done on a character-by-character basis, and any imbedded signals are filtered out as printing occurs. This analysis also makes it very easy to count the number of words in the manuscript; any space not preceded by another space is considered to represent a word separator. The program starts underlining just after it encounters a “\_” signal and stops when a “I” appears. I can tell you from much experience that you will underline a lot of text if you forget the “I”; I made the mistake so many times that I finally put in a 160-character limit to avoid wasting page after page this

**“The whole thing happens almost as fast as most printers can print.”**

way. Next, any subscripts are printed; they were removed and stored by CHECK\_SIGNALS. Finally, if the line is to be printed boldface, the paper is scrolled up one line, the printhead is moved 1/120 inch to the right, and the whole process is repeated once again. Fortunately, Pascal operates so fast that the whole thing happens almost as fast as most printers can print.

At the end of each line, LINE\_FEED is called to add extra linefeeds if double or triple (or greater) spacing is required. It calls TEST\_LINES to see if the bottom of the page has been reached; if so it calls BOTTOM\_PAGE, which, in turn, calls PRINT\_FOOT to print footnotes, if any. One of the hardest things to solve was the infuriating situation that occurs when long footnotes occur in the text where there is not enough space left to print them. This program prints any leftover footnote lines as the first footnote on the next page. (At least my solution is no worse than one \$300+ commercial word processor I have; it suggested that you reprint the entire document, inserting a “page” command just before the line that contains the troublesome footnote.) This was the last feature added to this program, and it may still contain a few bugs lurking in the background. I have tested it every way I can, but (unlike

Would You Like to Make  
Programming Just Plain Easier? Easier to Learn—  
Easier To Do—and 3 Times Faster?!



## The Hollywood Hardware Firmware Enhancement System

### Why You Need It:

We take all the enhancements that transform the Apple from a novelty to a powerful instrument, and hook them into the operating system, installed on their own FIRMWARE card. NO disk loading, NO loss of available memory space, NO interface with other programs. The system never need be removed - it is unhooked with two keystrokes, rehooked with four. ALWAYS IN THE MACHINE, NEVER IN THE WAY.

### The Response: We Get a Lot of Nice Comments:

"...Excellent product, flawless..." Phil Daley

"...Hollywood Hardware has developed an elegant solution...it makes editing an Applesoft program all it should have been in the first place, and then some..." SOFTALK review

"...The best thing for the Apple since the disk" Edward Decker

### The Basic System Includes:

**\$189<sup>00</sup>**

a) The ULTRA-ROM BOARD (APB102A) Installs 32K of firmware space in any slot of your II, II+, //e. Requires no program memory.

"Nice looking, high quality hardware." ... Robert Zedelis

b) GPLE 4.2: Enhanced version of the original editor that ALLOWS good programming practice. GLOBAL SEARCH, automatic EDIT or REPLACE, INSERT, DELETE, FIND, ZAP, CASE CONVERT and RESTORE variables, or characters. We guarantee you will never want to be without it. FUNCTIONS. Sets between the keyboard and the rest of the Apple - so any key can double as a FUNCTION KEY that generates a whole command string. Over 60 of the most used are provided as MACROS. System users never type "CATALOG, D1", or SAVE <filename>. Just type TWO keys: ESC 1, or ESC CTRL-S.

CUSTOMIZE and save your own macros!

"The most powerful program tool I have..." Robert Wilson

"If you program, and haven't used a line editor, get one right away..." Micro Magazine review

c) FMS: The FIRMWARE MANAGEMENT SYSTEM Finds and enables the desired routine with automatic bank switching. New ROMS are recognized automatically.

"...The integrated memory management system is one of the best features of the board." Mark Simonson, Beagle Brothers.

d) APU-1: Over 25 UTILITIES Invoked by the "&" key: Ultra fast searches, Garbage program recovery. Instant numerical conversions, Graphics state controls. Language extensions like PRINT USING and IF, THEN, ELSE are included, and provided in disk form for portability.

"...P.S. love it! Can hardly wait for more!" Paul Fox

### Optional Additions Include:

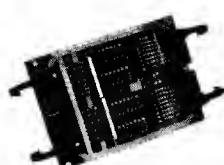
e) NEW! APU-2: superRENUMBER, multiHIDE, multiMERGE, VARIABLE \$35<sup>00</sup>

CROSS REFERENCE, AUTONUMBER. NEW programs by Paul Johnson. Far more powerful and mistake proof than other versions...and you don't destroy your own program loading them in from disk. They are always at hand.

f) NEW! COPY ZAP by Glen Bedon - author of BIG MAC. SMART DISK \$39<sup>95</sup> COPIER, and ZAP utilities written for our system. Also copies 40 track disks! Hit "&COPY" and watch!

g) NEW! ROM DEVELOPMENT SYSTEM: Program your own firmware! \$99<sup>00</sup> Includes software, documentation and emulation RAM.

## 12 Bit 16 Channel Data Acquisition 12 BIT 16 CH. A/D SIGNAL CONDITIONING



**AD16B \$299<sup>95</sup>**

- \* IRQ or NMI INTERRUPT
- \* PRECISION SAMPLE & HOLD
- \* EXTERNAL START CONVERT
- \* HIGH SPEED - 25,000 CONV/SEC
- \* 7 VOLTAGE RANGES
- \* PRECISION REFERENCE OUT
- \* SUCCESSIVE APPROX. CONVERTOR
- \* COMPLETE SOFTWARE INCL. DEMOSCOPE

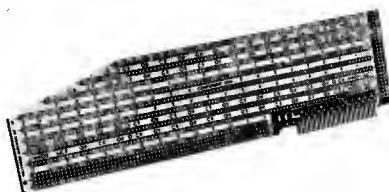
**A16G \$79<sup>95</sup>**

- \* BOLT-ON FITS IN APPLE
- \* 16 OP AMPS
- \* EACH CHANNEL SEPARATE GAIN & FILTERING

**A8D from \$149<sup>95</sup>**

- \* 2 to 8 CHANNELS
- \* TRUE DIFFERENTIAL INPUTS
- \* BOLT-ON FITS IN APPLE
- \* GAIN JUMPER EACH CHANNEL
- \* GAINS OF 1, 10, 100, 1000

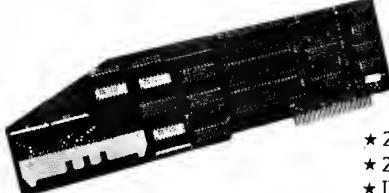
## PRO-1 PROTOTYPING BOARD



**THE BIGGEST  
THE BEST  
\$29<sup>95</sup>**

- \* ALL IC'S LETTERED BY COLUMN, NUMBERED BY ROW
- \* ACCEPTS ALL STANDARD SOCKETS - UP TO 52 (16 PIN)
- \* NUMBERED INPUT & OUTPUT PINS ACCEPT I.D.S. CONNECTOR
- \* ±5 AND ±12 SUPPLIES HANDY & WITH SPACE FOR FILTERING
- \* GOLD PLATED EDGE CONNECTOR, PREMIUM BLACK BOARD

## 48 Line Parallel I/O PD48



**\$249<sup>95</sup>**

W/50 COND. RIBBON CABLE

- \* 25 FILTERED LINES IN
- \* 23 BUFFERED LINES OUT
- \* INTERRUPT INPUT
- \* 4 TIMERS

## ADDITIONAL FINE PRODUCTS:

### \* MACROTECH MEMORY EXPANSION

DISCULATOR 64K	— \$379.95
DISCULATOR 128K	— 459.95

### \* ANCHOR AUTOMATION MODEMS

VM-1 VOLKSMODEM 300 BAUD	— \$64.95
VM-1 CABLE	— 9.95
SIGNALMAN MARK II 300 BAUD	— 79.95
MARK VII, 300 BAUD, AUTO	— 109.95
MARK XII SMART MODEM	— 299.95
300/1200 BAUD AUTO ANSWER	
BELL 212, RS 232, HAYES* COMPATABLE	

### \* HOLLYWOOD HARDWARE T-SHIRT

SM, MED, LG, XLG	— 12.00
------------------	---------

\*TRADEMARK HAYES MICROCOMPUTER PRODUCTS

**Hollywood Hardware 6842 VALJEAN AVENUE, VAN NUYS, CA 91406 (818) 989-1204**

\*GPLE © 1983 NEIL KONZEN, SOLD UNDER LICENSE FROM SYNERGISTIC SOFTWARE / APPLE IS A REGISTERED TRADEMARK OF APPLE COMPUTERS INC.



*Listing continued.*

```

IF S=NULL THEN EXIT(GET_CAPS);
I:=1;
REPEAT
  IF S[I] IN ['A'..'Z'] THEN I:=I+1 ELSE
  BEGIN
    DELETE (S,I,1); IF I > 1 THEN I:=I-1;
  END;
UNTIL I>LENGTH(S);
IF LENGTH(S)=1 THEN S:=CONCAT(S,SPACE);

PROCEDURE PRINT_UNCHANGED; {Faster print with no formatting}
VAR I: INTEGER;
BEGIN
  IF LINE<>NULL THEN IF (LINE[1]<>'.' AND (LENGTH(LINE)>1)) THEN
    FOR I:=2 TO LENGTH(LINE) DO IF (LINE[I]=SPACE) AND (LINE[I-1]<>SPACE)
      THEN WORDS:=WORDS+1;
  WRITELN(DIABLO,LINE); WORDS:=WORDS+1; {Last one on line}
  LINE_FEED;
END;

PROCEDURE PRINT_LINE;
VAR SUPERSCRIPT,SUBSCRIPT: BITLEAN;
  SUP, SUB, I, TEMP: INTEGER;
  CH: CHAR;
  SUPERCH, SUBCH: PACKED ARRAY [1..40] OF CHAR;
  UNDERSET: SET OF CHAR;
  SAVELINE: STRING;
BEGIN
  MAKE_SPACING(PARTIAL);
  WRITE (DIABLO,CHR(27),CHR(I0)); {Negative linefeed on Diablo}
  IF NOT (LINE[1] IN COMMANDSET) THEN WRITE (DIABLO, SPACE); S:=0;
  FOR I:=2 TO LENGTH(LINE) DO
  BEGIN
    IF LINE[I-1]='^' THEN
    BEGIN
      S:=S+1; WRITE (DIABLO, SUPERCH[S]);
      END ELSE IF NOT (LINE[I] IN COMMANDSET) THEN WRITE (DIABLO, SPACE);
    END; {Line completed}
    WRITELN (DIABLO); {Back to main line}
    MAKE_SPACING (NORMAL);
  END; {PRINT-SUPERSCRIPTS}
END; {PRINT_SUBLIN}

PROCEDURE PRINT_SUBLIN;

```

*Listing continued.*

Circle 247 on Reader Service card.

## Put a Tutor in Your Apple Computer...



and sink your teeth into quality educational software from one of America's leading sources...Dorsett Educational Systems. We have over 1000 tutorial programs available! All feature full-time audio narration, easy to read upper- and lower-case characters, and visuals that clearly illustrate key concepts. These programs are designed to let students learn at their own pace, whether they are kindergarten level or college graduates; slow or exceptionally fast learners. And, anyway you slice it, the price for our software is ripe. Why not bite into our Apple tutorial programming today?

Only \$4.40 per program (\$8.80 for 2, one on each side of a half-hour cassette). \$59.90 for 16 programs (8 cassettes) in an album. Apple II requires a T/T Plug-in board, \$99.00, and T/T Stereo Cassette Player, \$79.90.

Send for a catalog of over 1000 programs for Apple, Atari, TRS-80, etc.

For more information, write or call:  
**TOLL FREE 1-800-654-3871**



Dealer  
inquiries  
welcome.

**DORSETT**  
Educational Systems, Inc.  
Box 1226, Norman, OK 73070

VISA • MasterCard

\*Apple is a registered trademark of Apple Computers

most other parts of the program) the footnote features have not been in use in my laboratory for two years or so. Scientific writing doesn't use footnotes very much.

The main program ends with a bit of decoration at the bottom of the screen, and the file has been printed, formatted just as you wanted it.

### Entering the Program

If all this description makes you think the program is worth the trouble of entering and compiling it, you should note a few things. First of all, this program is *long*; the textfile (not including the ENTRIES portion) occupies 40 blocks, which is the most the Apple Pascal system can handle. (Don't add extra spaces or comments; they won't fit.) So you must turn on the swapping option to get it all entered. This is done by going to the "Command:" level and typing S. You'll see

*Listing continued.*

```
VAR S, I: INTEGER;
BEGIN
  MAKE_SPACING(PARTIAL); WRITELN (DIABLD); {Positive linefeed}
  S:=0; IF NOT (LINE[1] IN COMMANDSET) THEN WRITE (DIABLD, SPACE);
  I:=1;
  REPEAT
    I:=I+1; IF LINE[I-1]='`' THEN
      BEGIN
        S:=S+1; WRITE (DIABLD,SUBCH(S));
        END ELSE IF NOT (LINE[I] IN COMMANDSET) THEN WRITE (DIABLO, SPACE);
    UNTIL S=SUB;
  MAKE_SPACING (REMAINDER); WRITELN (DIABLD); MAKE_SPACING (NDRMAL);
END; {PRINT-SUBS}

PROCEDURE CHECK_SIGNALS;
VAR I: INTEGER;

PROCEDURE READ_COMMAND;
VAR COMMAND, STORED:STRING;
I: INTEGER;

FUNCTION GET_NUM: REAL;
BEGIN
  IF STORED=NULL THEN EXIT(GET_NUM);
  I:=1;
  REPEAT
    IF STORED[I] IN ['.', '0'...'9'] THEN I:=I+1 ELSE
      BEGIN
        DELETE (STDRED,I,1); IF I > 1 THEN I:=I-1;
      END;
  UNTIL I>LENGTH(STDRED);
  GET_NUM:=(VALUE (STDRED));
END;

PROCEDURE INCLUDE_FILE;
VAR IMMEDIATE: BOOLEAN;
FIRST, SECOND, N: INTEGER;

PROCEDURE GET_OUT;
BEGIN
  WRITE(CHR(7)); WRITELN (DIABLO);
  WRITELN (DIABLD, 'CAN''T USE ',INFILE);
  WRITELN(DIABLO); LINES:=LINES+3; EXIT(INCLUDE_FILE);
END;

BEGIN
  IF INSAVED THEN PRINT_INCLFILE; {ONLY ONE AT A TIME}
  COMMAND:=CONCAT(COMMAND,SPACE,SPACE);

```

*Listing continued.*

the prompt:

Swapping is off.  
Toggle Swapping?

Type Y in response. It will look as if nothing happened, but you can now have 40 blocks in a textfile, rather than the usual limit of 34. This is mentioned on page 7 of the Addendum to the *Apple Pascal Operating System Reference Manual*; I don't think it works in the 1.0 version of Apple Pascal. If you are using that system, you will have to break the Diablo textfile into two parts and treat the second part as an include-file using the (\*\$I filename\*) compiler directive.

You'll have to do that to get the GET\_CHAR, GET\_ENTRY, and VALUE utilities, too, if you didn't put my ENTRIES unit in your SYSTEM LIBRARY as described in the January 1983 issue of *inCider*. A somewhat shortened version is pre-

Circle 352 on Reader Service card.

**20 MB Hard Disk only \$1695!**

**PLUG IN AND GO!** We have a full line of Apple compatible 5-25 MB removable cartridge and/or fixed drive systems. All drives come complete with:

- Cabling
- Installation instructions
- 120 day no-hassle warranty
- Factory tested approval

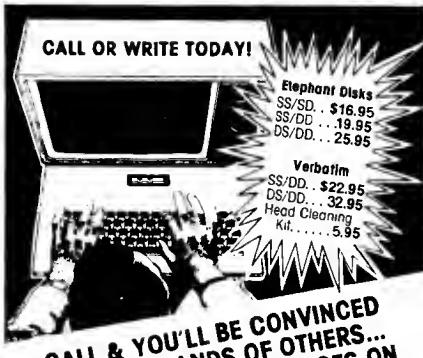
Send for our FREE catalog—Circle the reader response number:  
Call Toll Free to order: 1 (800) 531-5002. In Texas call (512) 441-7890.

**Slimline & Full size Floppy Disk Drives from \$199.95**

Controller cards only \$59.95

**MICRO DESIGN**

6301 B Manchaca Rd. Austin, TX 78745



**CALL & YOU'LL BE CONVINCED  
LIKE THOUSANDS OF OTHERS...  
WE'VE GOT THE BEST PRICES ON  
HARDWARE & SOFTWARE!**

Alpha Plot	\$24.95	Delta Drawing	\$34.95
Apple Mechanic	19.95	Face Maker	24.95
Beagle Bag	19.95	Hey Diddle Diddle	20.95
Beagle BASIC	23.95	Kinder Camp	20.95
DiskQuick	19.95	Rhymes & Riddles	20.95
DOS Boss	15.95	Snooper Troops	20.95
Double Take	22.95	Story Machine	24.95
Flex Type	19.95	Most Amaz. Thing	26.95
Frame-Up	19.95	Trains	27.95
GPLE	32.95	Cubit	29.95
Prono DOS	19.95	Drol	24.95
Silicon Salad	16.95	Flight Simulator II	36.95
Tip Disk #1	13.95	Lode Runner	23.95
TypeTaces	13.95	Maze Craze	27.95
Utility City	19.95	Cosmic Balance	27.95
Ultima III	39.95	S.E.U.I.S.	27.95
Caverns of Callisto	22.95	Germany 1985	41.95
Zork I, II, or III	ea. 24.95	Geopolitique 1990	27.95
Starcross	24.95	Eagles	27.95
Deadline	32.95	Fortress	24.95
Suspended	32.95	Sammy Lightfoot	20.95
Witness	32.95	Stellar 7	22.95
Planetfall	32.95	Castle Wolfen.	20.95
Enchanter	32.95	Millionaire	41.95
Infidel	32.95	Cross Word Magic	34.95
PFS: File	79.95	Chopifier	24.95
PFS: Report	79.95	Zaxxon	25.95
PFS: Graph	79.95	Miner 2049er	25.95
PFS: Write	79.95	Learning w/Leaper	24.95
Bounc. Kamungas	13.95	Sargon III	34.95
Coveted Mirror	13.95	Titan Empire	24.95
Minit Man	13.95	Home Accountant	47.95
Quest	13.95	The Accountant	99.95
Transylvania	13.95	VersaForm	248.95
Graphics Magician	38.95	Dollars & Sense	69.95
Chivalry	34.95	VisiCalc 3.3	146.95
Old Ironsides	27.95	MultiPlan	169.95
Sticky Bear ABC	26.95	Incredible Jack	124.95
Shapes	26.95	MasterType	27.95
Opposites	26.95	Bank Street Writer	43.95
Basket Bounce	26.95	Homework	46.95
BOP	26.95	Screen Writer II	81.95
Numbers	26.95	Zardax	154.95
Hard Hat Mack	26.95	Magic Window II	93.95
Axis Assassin	26.95	Sensible Speller	78.95
Last Gladiator	26.95	Visible 6502	39.95
One-On-One	29.95	Micro Cookbook	27.95
Standing Stones	29.95	Fontrix	52.95
Pinball Construct.	29.95	Ess. Data Dup.	48.95
Music Construct.	29.95	Copt II Plus	23.95
Cut & Paste	37.95	Locksmith 5.0	73.95
Wizardry	32.95	Mailing List	34.95
Knight of Dia.	22.95	FCM	65.95
Legacy of Lylg.	26.95	CompuServe Pack	29.95
Crypt of Medea	24.95	THINKTalk	104.95
AIRSIM-3	35.95	Wildcard	79.95
Spitfire Simulator	31.95	Wildcard 2	104.95
Aztec	27.95	Datalife Analyzer	24.95
Crypto Cube	27.95	Zoom Grafix	32.95
Flip Out	19.95	ASC II Profess.	85.95
Repton	26.95	Mockinboard	149.95
Time Zone	69.95	Koala Pad	84.95
Star Blazer	22.95	Gemini 10X	279.95
Aerobics	31.95	Flip-N-File	19.95
Alphabet Zoo	20.95	Dynax DX-15	444.95

Personal checks allow 7 weeks. We accept Visa & MasterCard (add 3% for handling). Send or call with card no. & exp. date. Include \$3.00 for shipping (printers & monitors \$10.00). Ohio residents add 5% state sales tax. Prices are subject to change without notice.

**FAS-TRACK**  
**COMPUTER PRODUCTS**

Box 523  
Columbus, Ohio 43216  
(614) 863-1699  
OR TOLL-FREE OUTSIDE OHIO  
**1-800-272-1600**

*Listing continued.*

```

IMMEDIATE:=COMMAND[3]='I';
COMMAND:=STORED; N:=0;
FIRST:=PDS(" ",COMMAND); IF FIRST<>0 THEN DELETE(COMMAND,FIRST,1);
SECOND:=PDS(" ",COMMAND);
IF (FIRST=0) DR (SECOND=0) THEN
BEGIN
  INFILE:=COMMAND; GET_OUT;
END;
INFILE:=COPY(COMMAND,FIRST,SECOND-FIRST);
GDTDXY(0,22); WRITE('Reading ',INFILE);
($$I*) RESET(INCLFILE,INFILE); ($$I*)
IF (IDRESULT=0) THEN
BEGIN
  IF NOT IMMEDIATE THEN WHILE NOT EOF(INCLFILE) DO
  BEGIN
    INCL_LINE; WRITE('.');
    IF LINE='.' THEN N:=N+1 ELSE IF LINE[1]<>'. ' THEN N:=N+1;
  END;
END ELSE GET_OUT;
CLOSE(INCLFILE); GDTDXY(0,23); WRITE(N,' Lines included.');
IF ((LINES+N) <= (PAGELEN-MARGINS)) DR IMMEDIATE
  THEN PRINT_INCLFILE ELSE INSAVED:=TRUE;
END; (INCLUDE-FILE)

PROCEDURE READ_FDDT;
VAR S: STRING;
  ENDFOOT: BDOLEAN;

PROCEDURE GET_LINE;
BEGIN
  IF INCLUDING THEN INCL_LINE ELSE NEXT_LINE; S:=LINE;
END;

BEGIN
  IF FLINES>=MAXFOOT THEN EXIT(READ_FOOT);
  FSTRING(FLINES):=SPACE; FLINES:=FLINES+1; {Space between footnotes}
  GET_LINE; {Remove Command, get first line of footnote}
  FSTRING(FLINES):=LINE;
  ENDFOOT:=FALSE;
REPEAT
  GET_LINE;
  IF S=NULL THEN S:=SPACE; {Avoid value range error next line}
  IF S1J=.'.' THEN ENDFOOT:=TRUE ELSE {Other signals not allowed}
  BEGIN {Add another line to the footnote}
    FLINES:=FLINES+1; FSTRING(FLINES):=S;
  END;
UNTIL ENDFOOT DR (FLINES=MAXFOOT);

TEST_LINES; {Starting printing footnote if necessary for it to fit}
END; (READ-FDDT)

PROCEDURE SAVE_FOR_CHART;
VAR SPACES: INTEGER;
BEGIN
  SPACES:=ROUND(6*GET_NUM);
  IF LINES+SPACES <= PAGELEN - MARGINS THEN
  BEGIN {Enough space on the current page}
    FDR I:=1 TD SPACES DO WRITELN (DIABLD);
    LINES:=LINES+SPACES;
  END ELSE
  BEGIN {Not enough space; have to put on next page}
    I:=1;
    WHILE (SAVE_SPACES[I]<>0) AND (I<6) DO I:=I+1;
    SAVE_SPACES[I]:=SPACES;
  END;
END;

PROCEDURE CHECK_LINES;
VAR S: INTEGER;
BEGIN
  S:=RDUND(GET_NUM);
  IF S+LINES >= PAGELEN-MARGINS THEN BDTTDM_PAGE;
END;

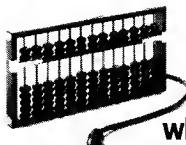
PROCEDURE INTERRUPT_PRINT;
BEGIN
  CLEAR_BOTTOM;
  WRITELN(CHR(7),'Change the daisywheel as desired; press <RETURN>');
  UNITCLEAR(1); READLN;
END;

BEGIN {MAIN READ-COMMAND}
DELETE(LINE,1,1); {Remove the signal}
COMMAND:=LINE; STDRED:=COMMAND;
GET_CAPS(COMMAND);
{You can add your own commands here - customize the program}
CASE COMMAND[1] OF
  'C': INTERRUPT_PRINT; {C}
  'D': CASE COMMAND[2] OF
    'F': FORMATTING:=FALSE; {DF}
    'N': PRINTNUM:=FALSE; {DN}
    'P': CHECK_LINES; {DPn}
    'S': FORMATTING:=TRUE; {DS}
    'U': UNDERSPACE:=FALSE; {DU}
  END;
  'F': CASE COMMAND[2] OF
    'P': FORMATTING:=TRUE; {FP}
    'S': HALF:=FALSE; {FS}
  END;
  'H': IF COMMAND[2] IN ['S','O'] THEN HALF:=TRUE;
  'I': IF COMMAND[2]=F' THEN INCLUDE_FILE;
  'N': CASE COMMAND[2] OF
    'M': PLUSMINUS:=FALSE; {NM}
    'N': PAGE:=RDUND(GET_NUM)-1; {NNn}
  END;
END;

```

*Listing continued.*

# The portable computer you expected from Apple.



We don't know why they never built one. But we know why we built the Abacus Portable.

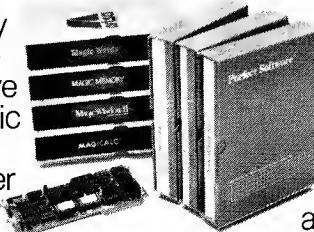
We built it because we recognized the pure logic of an Apple and CP/M compatible that wasn't deskbound. Chances are, you have, too. Especially if you're already using an Apple. The Abacus Portable runs all the same software and peripherals. It runs them just as well. And it will do something your Apple can't do. It will go wherever you go.

**With a price starting at \$1795, portability alone makes Abacus an unexpected value. But there's more.**

Abacus includes quality features found in the world's finest portables. There's a 9-inch amber monitor. A detachable keyboard

with true upper and lower case, auto repeat and 40 function keys. 80K RAM. Choice of one or two half-height disk drives. And a rugged aluminum case. You'll find features like these on the world's finest computers. That's why you'll find them on the Abacus Portable. We've also included the Magic software collection from ArtSci. That's over \$700 worth of word processor, spelling dictionary, spread sheet and data base. It's quality software for a quality computer. And it's

free with the Abacus Portable. If you want more, check out our Abacus Perfect 80 option. It includes Perfect Writer, Perfect Speller, Perfect Calc and Perfect Filer...the hottest software around...plus an Advanced Logic Systems 80



column card. Add it up and you've got well over \$2000 worth. Buy an Abacus Portable and the Perfect 80 package is yours for just \$299.

**You can expect to stay with Abacus for a long time.** That's because we designed Abacus to grow and change with your computing needs. You can start with a single disk drive and add your second drive later. You can begin with Apple and CP/M software and add our PCMate IBM compatibility upgrade. And the Abacus Portable is part of a complete line of quality hardware and software that also includes the fully compatible Abacus desktop. You see, we don't just build Abacus computers to meet your needs. We build them to live up to your expectations.

**To order the Abacus Portable, call collect (612) 340-1468 9AM-5PM CST for the name of your nearest Abacus dealer.**



**Abacus™**

510 No. First Ave., Suite 408, Mpls., MN 55403

**Value that computes.**

Circle 501 on Reader Service card.

Magic is a registered trademark of ArtSci, Inc.  
Perfect is a registered trademark of Perfect Software, Inc.  
PCMate is a registered trademark of CompuSource, Inc.  
Apple is a registered trademark of Apple Computer, Inc.  
IBM is a registered trademark of International Business Machines Corporation

(ASCII CHR to send for the Specified Function)

FUNCTION	DIABLO 620 (Also Apple LQ)	EPSON MX-80 (with Graftrax)	APPLE DOT MATRIX (not tested*)	DAISYWRITER (See note)
Backspace	8	8	8	CHR(8)
Negative Linefeed	27,10	Not Available	27,144	ESC,'R',0,1
Partial Spacing (vertical)	27,30,n+1 (n/48 inch)	27,65,n (n/72 inch)	27,84,n,0 (n/144 inch)	ESC,8,0,n (n/48 inch)
Partial Spacing (horizontal)	27,31,n+1 (n/128 inch)	Not Available	Not Available	Not needed
Boldface	Not available	27,69	27,33	ESC,'0' (Alternative to partial horizontal spacing to emphasize characters)

\*These commands were read from the Dot Matrix Printer Reference Card, but could not be tested with the equipment available to me.

Note - for the Daisywriter, these signals are sent as letters and numbers indicated - i.e., a negative linefeed is obtained by WRITE(DIABLO,CHR(27),'R',0,1); and boldface printing is turned on by WRITE(DIABLO,CHR(27),'O'); (letter O, not zero).

Table 2. Printer signals used in DIABLOPRT.

sented here (less error checking, no exponentials, etc., in the VALUE function); it can be used as an include-file for the main DIABLOPRT program, if you don't want to use the LIBRARY unit.

Unless you have a printer *exactly* like mine (a Xerox 1700, which is essentially identical to a Diablo 630; the new Apple Letter Quality Printer responds to the same commands), you will have to do a little research in your printer manual to see what commands to transmit to get the desired printer response. I've put together a list for the few printers for which I could find manuals (see Table 2), but these things can be hard to find. Possibly you could write the manufacturer of your printer if the manual doesn't have the necessary information. Depending upon the quirks of your printer, you might have to make changes in procedures MAKE\_SPACING, PRINT\_SUP,

Circle 49 on Reader Service card.

## MASTER HORSE HANDICAPPER™



EVALUATES FROM RACING FORM!

Age	Gender	Post (Today)
Class	Jockey (Today)	Post (Last)
Condition	Jockey (Last)	Speed
Consistency	Length	Trainer
Earnings	Time of Year	Workouts

And gives you GRAPHIC REPRESENTATION of finish

ADAPTS TO ANY TRACK IN THE WORLD

Quickly and easily be changing data statements relating to local track records/jockeys and trainers.

COMPLETE INSTRUCTIONS INCLUDED

### TH. Master Thoroughbred Handicapper™

A "Full Featured" Thoroughbred Program for the professional and serious novice. A menu driven program that deals with "all" relevant variables found on the RACING FORM.

MEM 32K \$99<sup>95</sup>

### OH. Master Quarterhorse Program™

Complete Quarterhorse analysis designed for the "close" finishes involved in this type of race. This program is designed around intricate "Speed" ratings but includes all handicapping variables. Complete with instructions.

MEM 32K \$99<sup>95</sup>

### MB. Master Bettor™

A compliment to ALL Master Handicapper programs, includes: 1) Win/Place/Show 2) Quinella 3) Exacta 4) Trifecta 5) Pick Six 6) Daily Double 7) Money Management 8) Odds Analysis 9) and Much More. A perfect program designed to use results from all Master Programs to generate "best bet". MEM 16K \$59<sup>95</sup>

Apple™ is the trademark of Apple Computer, Inc.

**"NEVER LOSE AGAIN"**

## NEW GOLD EDITION

GLD. ENHANCED "GOLD" EDITION™  
The ultimate analysis system including everything on Program TH™ plus:

- 1) Daily Track Variance
- 2) Expanded Instructions
- 3) Enhanced Error Trapping
- 4) Distance range 3 furlongs to 1 1/2 miles (1 mi. 70 yds.)
- 5) + + More

\$159<sup>95</sup>

### DA. Master Dog Analysis™

The only professional dog handicapper on the market, includes:

- 1) Speed
- 2) Post Today
- 3) Kennel
- 4) Post Lane
- 5) Distance
- 6) Condition
- 7) Running Style
- 8) Weight
- 9) plus much more.

If you are near a greyhound track, you can't afford not to use this program.

MEM 32K \$99<sup>95</sup>

### Professor Jones' Football Predictor, Prof. Pix

This complete football analysis will predict:

- 1) Overlays
- 2) Point Spreads
- 3) "Superplays"
- 4) "Over/Under" Bets.

For NFL/USL/College. Specify Mod I/III

T - \$19<sup>95</sup> D \$24<sup>95</sup>

### Track Management™

A revolutionary data base program designed to keep records on "ALL" horses or dogs running at a track. Can also be used to expand Jockey/Trainer stats in all Master Handicapper™ programs. A

**MUST FOR THE SERIOUS HANDICAPPER.**

(48K, Disk Only) \$69<sup>95</sup>

## PROF. JONES' PROFESSIONAL COMPUTER SYSTEM

- A. Apple Soft™ compatible (with Apple Filer)
- B. CPM™ compatible (includes card)
- C. 64K memory
- D. Disk drive
- E. Drive controller
- F. High resolution monitor (green)
- G. All cables etc.
- H. Your choice of one gambling program by Prof. Jones

Complete Price \$1195<sup>00</sup> (until I run out)

### HARDWARE

Disk Drive . . . . .	\$229 <sup>95</sup>
Controller . . . . .	\$59 <sup>95</sup>
Echo Speech Synthesizer . . . . .	\$249 <sup>95</sup>
Echo II . . . . .	\$139 <sup>95</sup>
Orange Grappler + . . . . .	\$149 <sup>95</sup>
Buffer Board . . . . .	\$129 <sup>95</sup>
High Res Monitors . . . . .	CALL

### ENTERTAINMENT

"Saigon, The Final Days" . . . . .	\$349 <sup>95</sup>
"Programmers Flight System" . . . . .	\$45 <sup>95</sup>

PROGRAMS AVAILABLE FOR: WE CARRY  
TRS-80 I, III, 4 MANY ITEMS  
Apple™ II, II+, II+ NOT LISTED  
CPM 2.2, 3.0

SOON: MS-DOS, MOD 100

Send check / money order / VISA / Mastercharge  
(Include expiration date) to:

**Prof. Jones**

1114 N. 24th St.  
Boise, ID 83702



TERMS: FREE SHIPPING ALL SOFTWARE.  
Add \$6.00 hardware / C.O.D. Add \$6.00 / Add 3 weeks personal checks / Add 4.5% ID residents / Add \$6.00 outside U.S.A. / Prices subject to change.

DEALER INQUIRIES INVITED

*Listing continued.*

PRINT\_SUBS, and PRINT\_LINE (the PRINTBOLD part) to make things work properly on your printer. And if (like the Epsons) your printer can't do negative linefeeds, you'll have to take an entirely different approach to superscripts. There are so many differences among printers that I just couldn't write anything universal for this problem. If your printer can't do variable line spacing, you might be able to employ half-linefeeds for superscripts and subscripts (this is not quite as satisfactory because it gives slight overlap when single spacing). That would require some modification of the PRINT\_SUP and PRINT\_SUBS procedures.

Good luck in entering and compiling this program. Next month we'll add the format choice and file entry procedures that make DIABLOPRT capable of printing a whole book without any attention from you. ■

Circle 344 on Reader Service card.

## THE BUILDING BLOCKS OF A GREAT SYSTEM

We carry a full line of computer supplies at wholesale prices. Check our costs and you'll discover that there's no need to look elsewhere.

### — This Month's Moneysaver —

## BETTER DISKETTES

**SYNCOM**

Diskettes are 100% error-free, with a Write Enable Notch and a reinforced hub. Each come with a protective Tyvek® envelope, extremely durable and guards against static charge. Lifetime Guarantee & meets all industry standards (ISO, ECMA, ANSI, JIS) 10 in a package, polybagged and shrink-wrapped and come with labels. SS, DD are IBM compatible.

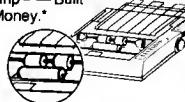
No.	Item	Price per bag			wt. 1 lb.
		1-10	11-24	25 on up	
#626	5 1/4 SS, DD	17.00	16.00	15.00	
#627	5 1/4 DS, DD	22.00	21.00	20.00	

NOTE: SS, DD can be used as SS, SD.  
Tyvek® is a registered trademark of DuPont Co.

## AMAZING MICRO-GRIP

Finally! A way to add inexpensive friction feed to your Epson-type printer. We have Micro-Grip®! Now, instead of buying a new printer to accept both tractor and friction feed (very expensive!), we've manufactured a device to upgrade your old system for a fraction of the cost. Installed with a screwdriver, Micro-Grip® does not disturb the tractor capabilities of your printer. For Epson MX-70/80, RX80 and printers based on the Epson design, such as the IBM PC, Commodore and H.P. Micro-Grip® — Built by Us to Save You Time and Money.\*

**\$39.95**



NO.	QUANTITY	PRICE*
#670	1-5	39.95/EA
	6-11	35.95/EA.
	12 ON UP	29.95/EA.

\*PLUS SHIPPING

\*NOTE: Micro-Grip® is not a substitute for a letter quality printer. It is a retrofit mechanism for the purpose of obtaining single sheet correspondence from your tractor feed printer.

For Credit Card Orders ONLY!  
Call Toll Free 1-800-225-8249



**TERMS & CONDITIONS**  
A minimum order of 10.00 is required, not including shipping. Prices effective 2/1/84 and are subject to change without notice. Automatic credit is extended to federal agencies, but to keep our prices competitive, we must request payment with orders from all other individuals and institutions. No. C.O.D.s. Freight charges added to credit card orders. All others shipped freight-collect. CASH ONLY. No merchandise may be returned without prior written authorization from this office. Merchandise ordered in error or not wanted is subject to a 25% restocking charge. Defective material replaced at no charge. All returns limited to a merchandise credit only. Mass. residents add 5% sales tax.



**Bill Cole Enterprises, Inc.**

P.O. BOX 60 • DEPT. IN5 • WOLLASTON, MA 02170-0060 • 617-963-5510

*Listing continued.*

```

'P': PRINTPAGE==NULL; {NP}
'S': HALF:=FALSE; {NS}
END;
'P': CASE COMMAND[2] OF
  ' ': BOTTOM_PAGE; {P}
  'B': PRINTBOLD:=TRUE; {PB}
  'M': PLUSMINUS:=TRUE; {PM}
  'N': PRINTNUM:=TRUE; {PN}
  'P': PRINTPAGE:="Page"; {PP}
  'S': FORMATTING:=FALSE; {PS}
END;
'S': CASE COMMAND[2] OF
  'C', 'G': SAVE_FOR_CHART; {SC or SG}
  'F': READ_FOOT;
  'S': LINESPACE:=TRUNC(GET_NUM); {SSn}
END;
'U': IF COMMAND[2]='S' THEN UNDERSPACE:=TRUE;
END;
READ_COMMAND
BEGIN {MAIN CHECK-SIGNALS}
IF LINE=NULL THEN LINE:=SPACE; {Avoid value range errors}
IF LINE[1]='.' THEN
BEGIN
  READ_COMMAND; EXIT(PRINT_LINE);
END;
SUPERSCRIPT:=FALSE; SUBSCRIPT:=FALSE; SUP:=0; SUB:=0; {Initializing}
FOR I:=1 TO LENGTH (LINE) DO
BEGIN
  CH:=LINE[I];
  CASE CH OF
    ' ': BEGIN
      SUP:=SUP+1; SUPERCH[SUP]:=LINE[I+1];
      LINE[I+1]:=SPACE; SUPERSCRIPT:=TRUE;
    END;
    ' ': BEGIN
      SUB:=SUB+1; SUBCH[SUB]:=LINE[I+1];
      LINE[I+1]:=SPACE; SUBSCRIPT:=TRUE;
    END;
    ' ': LINE[I]:=SPACE;
    END; {CASE}
  END; {FOR I...}
END; {CHECK-SIGNALS}

BEGIN {MAIN PRINT-LINE} {This is the main part of the program}
MAKE_SPACING(NORMAL);

```

# SELECT SOFTWARE, INC.

**ALL**  
the software  
you need at  
**30%  
OFF**

For Your Convenience:

**ORDER  
TOLL FREE**

**24 Hours a Day  
7 Days a Week**

NATIONAL:

**1-800-732-2666**

NEW YORK STATE:

**1-800-441-4442**

**SPEEDY  
SERVICE**

\$3.00 shipping and handling  
charge for ANY SIZE ORDER.  
New York State residents add  
appropriate sales tax.

**NO EXTRA CHARGE  
for MasterCard or Visa**



Allow 2 weeks for personal  
and business checks to clear  
before shipping.

**WRITE FREE PRICE  
FOR LIST**

**SELECT SOFTWARE, INC.**

P.O. Box 86  
Buffalo, N.Y. 14226

*Listing continued.*

```
IF (LINE=NULL) OR (LINE=SPACE) THEN
BEGIN
  IF HALF THEN
    BEGIN
      PART:=NOT PART; IF PART THEN LINES:=LINES-I; {Count half of linefeeds}
      MAKE_SPACING(NORMAL DIV 2); {Half-spacing}
    END;
    WRITELN(DIABLO); MAKE_SPACING(NORMAL); LINE_FEED; EXIT(PRINT_LINE);
  END;
  CHECK_SIGNALS;
  SAVELINE:=LINE; {For Boldface, if needed}
  IF SUPERSCRIPTS THEN PRINT_SUP;
  FOR I:=I TO LENGTH(LINE) DO
    BEGIN
      CH:=LINE[I];
      IF (CH=SPACE) AND (I>I) THEN
        BEGIN {Multiple spaces counted only as one word separator}
          IF LINE[I-1]>SPACE THEN WORDS:=WORDS+1;
        END;
      {The following line avoids double underline, printing underline signal}
      IF (UNDERLINE AND (CH='_')) THEN WRITE(DIABLO, '_') ELSE
        BEGIN
          IF UNDERSPACE THEN UNDERSET:=COMMANDSET
            ELSE UNDERSET:=COMMANDSET + [SPACE];
          IF CH='-' THEN UNDERLINE:=TRUE;
          IF (CH='+') OR (U>I60) THEN
            BEGIN
              U:=0; UNDERLINE:=FALSE;
            END;
          IF NOT (CH IN COMMANDSET) THEN WRITE(DIABLO, CH);
          IF (UNDERLINE AND NOT (CH IN UNDERSET)) {Underline}
            OR ((CH='+') AND PLUSMINUS)) THEN {plus or minus}
            BEGIN
              WRITE(DIABLO, CHR(8)); WRITE(DIABLO, '_'); U:=U+1;
            END;
        END;
      END; {FOR I...}
      WORDS:=WORDS-SUB;
      IF SUBSCRIPT THEN PRINT_SUBS ELSE WRITELN(DIABLO);
      IF PRINTBOLD THEN
        BEGIN {Prints again, moved over 1/120 inch to the right}
          TEMP:=WORD; LINE:=SAVELINE; {Restore any superscripts and subscripts}
          WRITE(DIABLO, CHR(27), CHR(I0)); {Negative Linefeed}
          LINES:=LINES-I;
          WRITE(DIABLO, CHR(27), CHR(31), CHR(2), SPACE, CHR(27), CHR(31), CHR(I1));
          PRINTBOLD:=FALSE; PRINT_LINE; {Only one line printed boldface}
          WORDS:=TEMP {Don't count second time in boldface print}
        END;
      LINE_FEED;
    END; {PRINT-LINE}
  PROCEDURE PROCESS_LINE;
  VAR TEMP: STRING;
  BEGIN
    IF LINE<>NULL THEN IF LINE[I]='. ' THEN
      BEGIN
        TEMP:=LINE; GET_CAPS(TEMP); IF LENGTH(TEMP)>2 THEN TEMP:=COPY(TEMP, I, 2);
        IF (TEMP='FP') OR (TEMP='OS') THEN FORMATTING:=TRUE;
      END;
    IF FORMATTING THEN PRINT_LINE ELSE PRINT_UNCHANGED;
  END;
  PROCEDURE READ_FILE;
  BEGIN
    WHILE NOT EOF(TEXTFILE) DO
      BEGIN
        NEXT_LINE; PROCESS_LINE;
      END;
    FINISHED:=TRUE;
  END; {READ_FILE}
  PROCEDURE ZERO_THINGS;
  VAR I: INTEGER;
  BEGIN
    ZERO_FOOT; SLINES:=0; U:=0; LINES:=0; WORDS:=0;
    ALLDONE:=FALSE; HALF:=FALSE; PART:=FALSE; UNDERLINE:=FALSE; PRINTBOLD:=FALSE;
    FINISHED:=FALSE; INSAVED:=FALSE; INCLUDING:=FALSE; NEWPAGE:=FALSE;
    FOR I:=1 TO MAXFILES DO FIRSTPAGE[I]:=I;
    FOR I:=I TO I0 DO SAVESPACE[I]:=0;
  END;
  PROCEDURE WRITE_STARS;
  CONST STARS='*****';
  BEGIN
    WRITE(' ':6, STARS); WRITE(STARS);
  END;
  BEGIN {MAIN PROGRAM}
    GENERAL_INSTR;
    ZERO_THINGS;
    COMMANDSET:=['^', '\', '_', '?', '"', '^'];
    WRITELN
    ('What running title is to be printed above the page number on each page?');
    WRITELN ('Press <RETURN> for no running title, "F" to print file names.');
    GET_ENTRY (75, RUNHEAD); FILEPRINT:=(RUNHEAD='F') OR (RUNHEAD='f');
    STANDARD_FORM;
    CHOOSE_FILES;
    WRITELN ('PUSH THE "TOF" SWITCH ON THE DIABLO,');
    WRITE ('AND PRESS <RETURN> (on the console) TO START PRINTING.');
    READLN;
    REWRITE(DIABLO, 'PRINTER:');
    IF FILEPRINT THEN RUNHEAD:=FILENAME[I]; J:=I; TOP_PAGE; {Top of first page}
    FOR J:=I TO TOTFILES DO {Only one this month}
  END;
```

*Listing continued.*

*Listing continued.*

```

BEGIN
  FINISHED:=FALSE;
  (*$I-*) RESET (TEXTFILE, FILENAME [J]); (*$I+*)
  IF IORESULT=0 THEN
    BEGIN
      IF FILEPRINT THEN RUNHEAD:=FILENAME[J];
      GOTOXY (0,J+3); WRITE ('PRINTING=>');
      IF J>1 THEN BEGIN GOTOXY (0,J+2); WRITE (' <DONE>   '); END;
      IF (FIRSTPAGE[J] > -1) THEN
        BEGIN
          IF FIRSTPAGE[J]<>0 THEN PAGE:=FIRSTPAGE [J];
          IF LINES<>MARGINS THEN BOTTOM_PAGE;
        END;
      READ_FILE; CLOSE (TEXTFILE);
      END ELSE WRITELN (DIABLO, FILENAME[J], ' NOT FOUND.');
    END;
  IF INSAVED THEN PRINT_INCLFILE;
  ALLDONE:=TRUE; IF FLINES>0 THEN PRINT_FOOT; {Print any leftovers}
  GOTOXY (0,J+2); WRITE (' <DONE>   '); CLEAR_BOTTOM;
  WRITELN('TOTAL OF ':30, WORDS, ' WORDS PRINTED.');
  WRITE_STARS;WRITELN;
  WRITELN (' *6,
  ***** OUTPUT COMPLETED *****
  WRITE_STARS;READLN {Wait to reinsert boot diskette if it was removed}
END.

```

```

FUNCTION GET_CHAR (PROMPT1, PROMPT2:STRING; ACCEPTABLE: RIGHT_ONES): CHAR;
VAR CH, ENTRY: CHAR;
BEGIN
  REPEAT
    WRITE (PROMPT1);
    IF PROMPT2 <> NULL THEN BEGIN WRITELN; WRITE (PROMPT2); END;
    UNITCLEAR (1);
    READ (ENTRY); WRITELN; IF ENTRY = CHR(27) THEN EXIT (PROGRAM);
    IF ENTRY IN ['a'..'z'] THEN ENTRY:=CHR(ORD(ENTRY)-32); {Capitalize}
    IF NOT (ENTRY IN ACCEPTABLE) THEN
      BEGIN
        WRITELN; WRITELN;
        WRITELN ('',ENTRY,'" is not an acceptable entry.', CHR(7));WRITELN;
        FOR CH:=CHR(33) TO 'z' DO IF CH IN ACCEPTABLE THEN WRITE ('',CH,'" ');
        IF SPACE IN ACCEPTABLE THEN WRITE (' <SPACE> ');
        WRITELN (' are appropriate entries at this point.'); WRITELN;
      END;
    UNTIL ENTRY IN ACCEPTABLE;
    GET_CHAR:=ENTRY;
  END; {GET-CHAR}

  PROCEDURE GET_ENTRY (LEN: INTEGER; VAR ENTRY: STRING);
  VAR I: INTEGER;
  SPACE: CHAR;
  BEGIN
    REPEAT
      WRITELN; ; FOR I := 1 TO LEN DO WRITE ('_'); WRITELN ('?');
      WRITE (CHR(31)); READLN (ENTRY); {CHR(31) is "move cursor up"}
      IF ENTRY<>NULL THEN
        BEGIN
          IF (LENGTH (ENTRY)=1) AND (ENTRY[1]=CHR(27)) THEN EXIT (PROGRAM);
          IF LENGTH (ENTRY) > LEN THEN
            BEGIN
              WRITELN (CHR(7),ENTRY, ' IS ',LENGTH(ENTRY)-LEN,' TOO LONG!');
              WRITELN ('PRESS <SPACE> AND MAKE A SHORTER ENTRY.');
              READ (SPACE); WRITELN;
            END;
        END;
      UNTIL LENGTH (ENTRY) <= LEN;
    END; {GET-ENTRY}

  FUNCTION VALUE (ENTRY: STRING): REAL;
  VAR I, COMMA, NUMDIGITS, POINT, POWER, MAGNITUDE: INTEGER;
  STOREENTRY:STRING[10];
  DIGIT: STRING[1]; {NOT the same as a CHAR, no matter what some books say}
  NUMBER: PACKED ARRAY [1..10] OF INTEGER;
  LESSTHAN1: BOOLEAN;
  DENOM, TEMP: REAL;

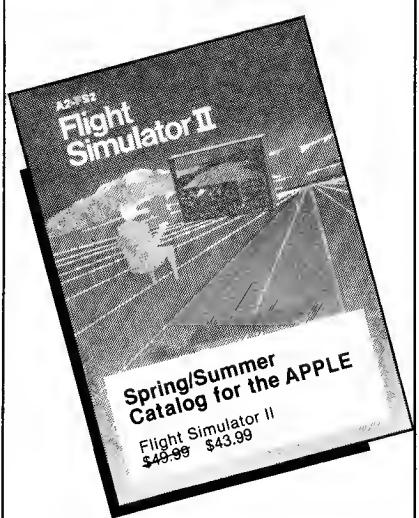
  BEGIN
    REPEAT
      IF ENTRY = NULL THEN
        BEGIN
          WRITE (CHR(7),'NO ENTRY WAS MADE! ENTER A NUMBER: ');
          READLN (ENTRY);
        END;
      UNTIL ENTRY<>NULL;
      POINT := POS ('.', ENTRY);
      IF POINT <> 0 THEN DELETE (ENTRY, POINT, 1); {*remove decimal point if there*}
      NUMDIGITS := LENGTH (ENTRY);
      FOR I := 1 TO NUMDIGITS DO
        BEGIN
          DIGIT := COPY (ENTRY, I, 1); NUMBER[I] := POS (DIGIT, '123456789');
        END;
      TEMP := 0; FOR I := 1 TO NUMDIGITS DO
        TEMP := TEMP + NUMBER[I] * PWROFTEN (NUMDIGITS - I);
      IF POINT <> 0 THEN DENOM := (PWROFTEN (NUMDIGITS - POINT + 1))
      ELSE DENOM := 1;
      TEMP := TEMP /DENOM; VALUE := TEMP;
    END; {VALUE}
  END.

```

*Listing 2. ENTRIES.*

Circle 82 on Reader Service card.


  
**Strictly  
Soft Ware**


  
**Flight Simulator II**  
 Spring/Summer Catalog for the APPLE  
 Flight Simulator II \$49.95 \$43.99

# Fly into Spring With Strictly Soft Ware

Send for free catalog today.

Strictly Soft Ware 1-614-587-2938

To receive your free catalog right away, send this coupon to the address below. Do you want our  Apple or  IBM Catalog?

NAME \_\_\_\_\_

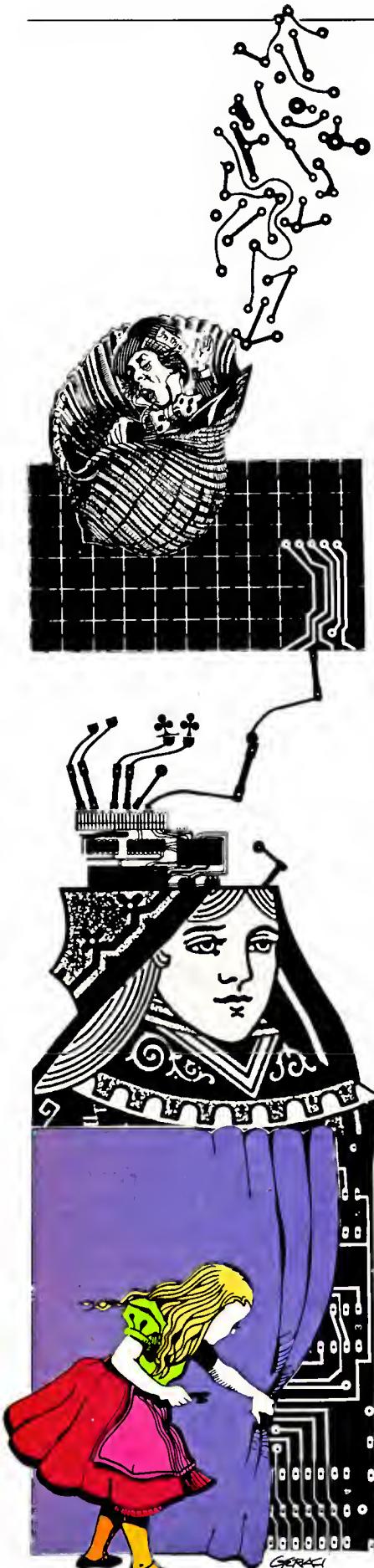
STREET \_\_\_\_\_

CITY	STATE	ZIP
( ) _____		
PHONE _____		

Strictly Soft Ware  
P.O. Box 338  
Granville, OH 43023

Strictly Soft Ware

May 1984 Cider 81



# inCider's inSidious inSolubles

by Art Ude

Welcome to *inCider's inSidious inSolubles*—a series of maddening challenges for you shrewd and observant programmers. Each month we list a short Applesoft Basic program that *seems* to run correctly—but there is something wrong. Oh, you won't see anything as obvious as SYNTAX ERR, or any other error for that matter. However, that programmer's sixth sense that you have developed slaving over a hot keyboard will tell you something is amiss. The answer appears elsewhere in the issue. Some solutions are very easy, some considerably harder. Some are "cute," some tricky.

The folks at *inCider* encourage readers to submit their own *inSidious inSolubles*. While there is no length limit, the shorter the better. All submissions should contain the correct solution and conform to all the specifications below. If your program is especially ingenious, you will receive either a free 12-month subscription to *inCider*, or a 12-month extension of your present subscription. Take a whack at it!

Here are the guidelines and suggestions for solving an *inSoluble*:

1. The Basic programs are in straightforward Applesoft. Any poked machine language subroutines and calls to that subroutine are correct.
2. You should get some kind of a result from the program; in other words, it shouldn't crash.
3. You should not get an error message of any kind. If you do, check your typing.
4. There will be a short explanation of

what the program is supposed to do. Read this explanation *carefully*. It may contain clues to the problem.

## The Savings Accrual

If you contribute a monthly amount to a savings account, it would be nice to know how much will be in that account after a period of years. The short program in the Listing should provide the answer. How are you with algorithms?

*Solution on page 140.*

```

10 TEXT : HOME : PRINT TAB(10)
    ** SAVINGS ACCRUAL **: PRINT
    : PRINT
20 INPUT "RATE OF INTEREST IN PE
    RCENT " ; RA:RA = RA / 100
30 PRINT : INPUT "DEPOSIT HOW MU
    CH EACH YEAR? $" ; FA
40 PRINT : INPUT "FOR HOW MANY Y
    EARS " ; PYRS
50 REM
YRS = NO. OF YEARS
    TA = TOTAL AMOUNT
    RA = RATE IN %
    A = AMOUNT ADDED
    EACH YEAR
60 FOR Y = 1 TO YRS
70 TA = TA + A + RA * TA
80 NEXT Y:TA = INT(TA * 100 +
    .5) / 100
90 PRINT : PRINT "TOTAL AFTER "
    YRS;" YEARS: $" ; TA
100 PRINT : PRINT "YOU COULD WIT
    HDRAW ABOUT $" ; INT(TA * RA
    )
110 PRINT "EVERY YEAR AND NEVER
    DEplete YOUR"; PRINT "ACCOuN
    T." : END

```

*Program listing. The Savings Accrual.*

*Submit your own *inSidious inSolubles* to Art Ude, c/o *inCider*, Pine St., Peterborough, NH 03458.*



**WORLD CHAMPS**

**WORLD'S BEST  
BASEBALL GAME!**

**I.Q. BASEBALL**

by Davka Corporation

is the world champion of sports knowledge games . . . and we've got the stats to prove it!!!

- REALISTIC ANIMATION
- GENUINE BALLPARK SOUNDS
- SURPRISE ACTION—EVEN A RAIN DELAY!
- CHALLENGING BASEBALL QUESTIONS

And the fans are behind us all the way. Says *Softalk*, "Delightful . . . great playability." "Beautifully executed," adds *Softline*. As a matter of fact, I.Q. BASEBALL was designated as the official Apple Computer baseball sweepstakes game!! So go with the champ . . . I.Q. BASEBALL!!

**IT'S A STEAL**

only \$24<sup>95</sup>

I.Q. BASEBALL is available for • Apple • Atari • Commodore • I.B.M. PC all with disk drive.

Separate question disks on your favorite team or a special World Series disk are available for \$14.95.

Ask for I.Q. BASEBALL at your favorite computer software store or order directly from Davka. Credit card holders may order toll-free. Dealer inquiries invited.

Call Toll-free 1-800-621-8227  
In Illinois call 1-312-944-4070

**Davka**  
CORPORATION

845 N. Michigan Ave. • Suite 843 • Chicago, IL 60611

Apple II/IIe

# If This Powerful Applesoft Editor Were Any Simpler, Your Keyboard Could Look Like This.

Meet the word processor for writing programs, complete with HELP Screens for quick reference.

With GALE (Global Applesoft Line Editor), single keys stand for long, complicated sequences of programming commands. Now you can automatically insert or delete changes in program lines. Or change a character or word wherever it appears. And no more re-typing the rest of a line after a change. So you spend significantly less time typing.

GALE eliminates dozens of keystroking operations while it lets you instantly renumber your program lines, or take two programs and merge them. Or see how much space is left on your disk.

You'll like the immediate cross-index of all your variable names, auto-line numbering and other valuable utilities.

With GALE you get the best features of a separate global editor, renumber, merge and utility library all combined in one system.

GALE! You'll wonder how you ever got along without it.

To order fill out the attached coupon or call 617-259-9710.

Author: Sandy Mossberg  
System Requirements: Applesoft compatibility and DOS 3.3  
Apple is a registered trademark of Apple Computer, Inc.  
Copyright © 1983 by MicroSPARC.



**MicroSPARC Inc.**

**I want GALE! Here's my \$49.95**

Mastercard     Visa     Check, M. O.  
(Mass. residents add 5% sales tax)

Name \_\_\_\_\_ Tel. # \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Charge Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

**MicroSPARC Inc., 10 Lewis St., Lincoln, MA 01773**

IN54

# The Compleat Text File Primer

## Part 3—Disk Operating Systems

Explore the subtleties and intricacies of DOS.

---

by Lee Swoboda

---

In Parts 1 and 2 of this series I discussed how data was stored on a disk and in the computer's memory. Now let's look at how the data gets from the disk to the memory.

A computer is a central processing unit with a collection of memory and input/output devices (keyboard, video screen, disk drives, printer, and so on). The computer needs some way to interconnect and control the functions of these components. These devices need hardware links, called the bus. The operating system controls and manages the interchange of data. This operating system is a collection of software and firmware (software in ROM) which determines how the components of the computer will operate.

The Apple II and IIe use two operating systems. The first, called the monitor, resides permanently in ROM and controls the Apple's primary functions: keyboard, video, input/output and Applesoft Basic. The second operating system, the Disk Operating System (DOS), resides on the first three tracks of each initialized disk and is loaded into user memory whenever the disk is booted. Why two operating systems? Remember that the Apple was originally designed as an inexpensive personal computer. The original intent was to use a cassette tape recorder as the main data-storage medium. The cassette is certainly an inexpensive storage medium, available in virtually every home. But it does have some significant disadvantages. Cassettes are

slow to load data and they must be operated manually. This makes them virtually useless as an interactive medium for storing programs and data. By interactive, I mean a data storage medium

that interacts with the computer—one that is under complete computer control. With a disk drive, on the other hand, the computer can purr along happily without any human interven-

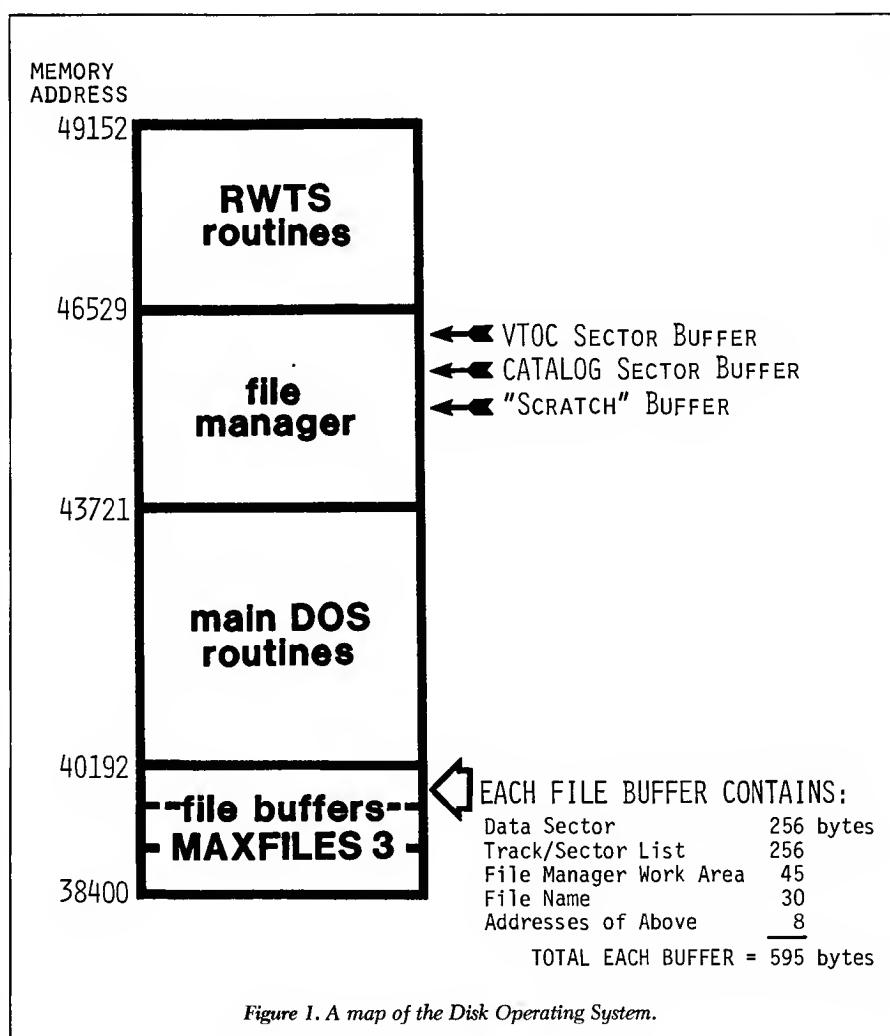


Figure 1. A map of the Disk Operating System.

# WILDCARD™

Make back-up copies of protected software quickly, easily, with just a push of a button.

Now! Two models of the leading copy card. One is right for you.

## WILDCARD

\$109<sup>95</sup>

## WILDCARD 2

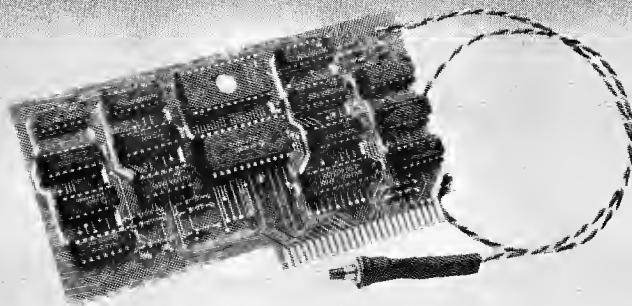
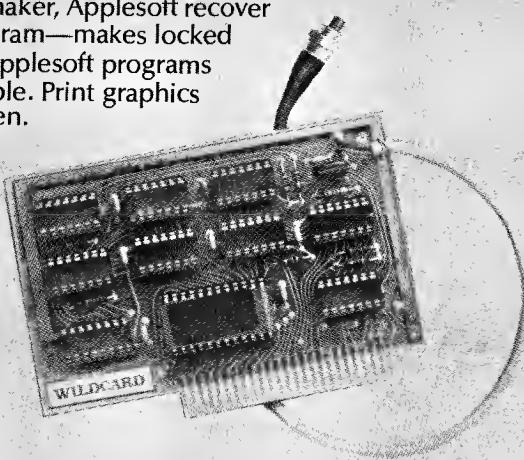
\$139<sup>95</sup>

Wildcards are the copycards that stack the deck in your favor. Rather than copying protected disks track by track like the old "nibble copiers," Wildcards ignore the disk and any copy protection on it. Instead, Wildcards take a snapshot of your Apple's memory. This creates an accurate copy of the original program.

### WILDCARD

Our original. Perfect for the Apple II+® with 64K. Over 10,000 satisfied customers.

- Wildcard copies both 48K and 64K programs.
- Wildcard creates DOS 3.3 compatible, autobooting copies.
- 40 column text screen dump.
- Files can be placed on a hard disk.
- Wildcard Utility Disk (included) contains: Automatic program compression and BRUN filemaker, Applesoft recover program—makes locked up Applesoft programs listable. Print graphics screen.



### WILDCARD 2

Designed for the Apple IIe® with 64K or 128K.

- Fast! Copies 64K programs in 25 seconds, 128K programs in 50 seconds.
- New, self-prompts software. Absolutely no technical expertise is required.
- Text screen dump has been enhanced to print 40 or 80 columns.
- Utility Disk is included for making BRUN files.
- New! Automatic compressor for compact BRUN files.
- Access Apple monitor, allowing for program changes and listings.

Order by phone, (212) 505-5470 or complete the coupon below and send your check, money order, Visa or MasterCard No. to East Side Software Co., 175 Fifth Avenue, Suite 3375, New York, NY 10010. Dealer inquiries welcome.

Please send (indicate quantity)

Wildcard(s) \$109.95 each. \_\_\_\_\_ \$\_\_\_\_\_

Franklin 1000/1200 owners require mod kit. \$8.00 \_\_\_\_\_  
(For use with Wildcard only.)

Wildcard 2(s) \$139.95 each. \_\_\_\_\_ \$\_\_\_\_\_

In U.S. add \$4.00 for shipping and handling.  
Outside U.S. add \$10.00. \_\_\_\_\_ \$\_\_\_\_\_

New York State residents add sales tax. \_\_\_\_\_ \$\_\_\_\_\_

Check enclosed    Visa    MasterCard   Total \$\_\_\_\_\_

Card No. \_\_\_\_\_ Expires \_\_\_\_\_

Name on Card \_\_\_\_\_

Name \_\_\_\_\_

Address (UPS delivery) \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

East Side Software Co., 175 Fifth Avenue, Suite 3375, New York, NY 10010

**IMPORTANT NOTICE:** WILDCARDS are offered for the purpose of enabling you to make archival copies only. Under the Copyright Law you, as the owner of a copy of a computer program, are entitled to make a new copy for archival purposes only and the WILDCARDS will enable you to do so. WILDCARDS are offered for no other purpose and you are not permitted to utilize them for any other use, other than specified. Software is not copy protected.

System requirements: Wildcard: Apple II+ w/64K, Apple IIe, Wildcard 2: Apple IIe, II+, II. All cards work with Franklin computers. An \$8.00 mod kit is required for Franklin 1000, 1200.

Wildcard and Wildcard 2 are trademarks of East Side Software Co.  
© 1984 East Side Software Co.

tion or interference. When consumers demanded that Apple provide a disk drive, Apple provided the hardware (disk drive and controller card), but also provided the software to patch that hardware into the existing operating system. This system is the Disk Operating System, DOS.

The concept of storing part of the operating system on disk is not unique to microcomputers. In fact, mini and mainframe computers usually have the entire operating system on disk. Only a minimal amount of bootstrap software is in ROM, just enough for the computer to load the operating system from disk. This way, it is relatively easy to modify, improve or update software on disk. It is significantly more difficult to update software in ROM, or worse, software permanently burned into a chip. Apple has already updated the DOS three times, the latest update being DOS 3.3. Each update has required only a software change or minor hardware change (two chips in the case of DOS 3.3)—obviously far superior to having to replace an entire controller card or disk drive.

When memory was relatively expensive, Apple built 16K and 32K versions of the Apple II. These relics are now scarce, but when Apple first introduced the disk drive, you could still buy Apples with various "rampowers." As a result, DOS boots (transfers) from disk to memory in three steps. Step 1 loads a small bootstrap program. Step 2 loads the DOS image from disk into the computer as if it had 16K of RAM. Step 3 relocates DOS to the top of available memory. With only one size Apple currently available, the process is now perfunctory, but also indicative of Apple's commitment to minimize obsolescence.

DOS is divided into a number of modules, each with discrete functions. Figure 1 is a rough map of DOS.

#### Command Parser

Whenever Basic encounters a control-D (ASCII = 4) character, it transfers control of the system to the Disk Operating System. When DOS takes control, it parses the received command by comparing it to a table of allowable commands. If the command is

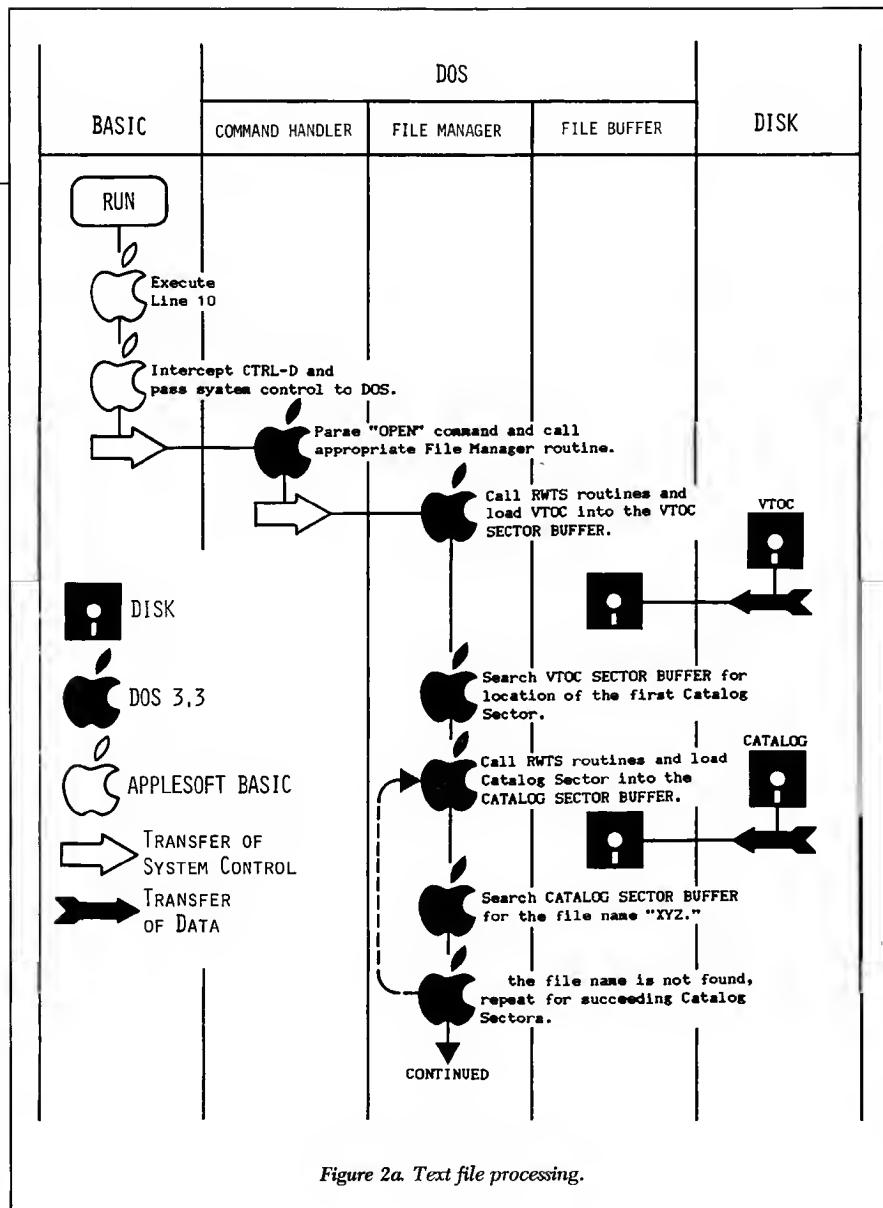


Figure 2a. Text file processing.

illegitimate, DOS will print an error message. If the command is legitimate, DOS will transfer the control to the appropriate subroutine. In the case of text file commands, DOS transfers control to the file manager.

#### File Manager

The file manager portion of DOS controls the means by which the Apple accesses the disk. The file manager also contains three buffers for temporary storage of data: a VTOC sector buffer, a catalog sector buffer and a 347-byte scratch buffer for storing the encoded raw data from the disk sector until the file manager can decode it. In addition to the routines in the file manager, DOS uses two other routines/buffers: the read/write track/sector routines and the file buffer.

Let's examine a typical text file process.

```

10 PRINT D$; "OPEN XYZ"
20 PRINT D$; "READ XYZ"
30 INPUT A$
40 PRINT D$; "CLOSE XYZ"

```

Figure 2 shows the process that the Apple DOS goes through to load data from the disk and make it available to a Basic program. Actually, the OPEN command is unnecessary for an existing file, since both the READ and WRITE routines check the file and open it if it is closed. Note in Figure 2 that the file manager does the majority of work. Also note that four separate buffers are required.

#### Read/Write Track/Sector (RWTS)

The RWTS routines read the "gaps" on the disk and find the appropriate track and sector, then read the data

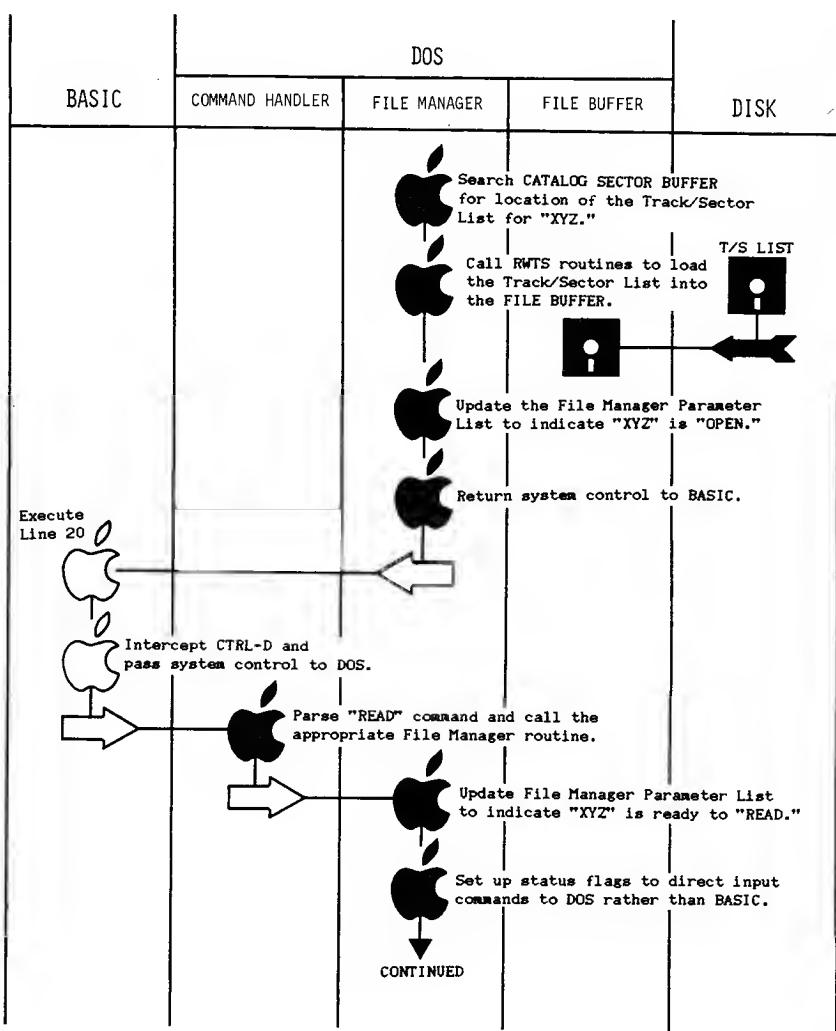


Figure 2b. Text file processing (continued).

within the sector and load the encoded data into a scratch buffer in the computer. The file manager then decodes the encoded data and transfers the results to a file buffer.

#### File Buffers

This stores data from the disk temporarily until it is transferred to the portion of the computer's memory that is under the program's direct control (the variable table or string storage area). DOS, in its default state, contains three file buffers, each occupying 595 bytes. Those 595 bytes contain the following data for each of three files:

- The last sector of data (256 bytes, decoded) loaded from the disk.
- The track/sector list for the file (256 bytes).
- A file manager work area containing information on the type and status

of the file occupying this buffer.

- The name of the file.
- The addresses of the above data.

#### Text File Access

Applesoft has three helpful text file commands that do not occur in some other Basics:

- APPEND
- B parameter
- POSITION

I will discuss these in Part 4 next month.

#### Modifying DOS

"Normal" DOS overhead (MAXFILES 3) is 10752 bytes, from addresses 38400-49152. The overhead can range from 9562 to 18487 bytes for MAXFILES 1 to 16 respectively. Since the string storage area begins immedi-

ately below the DOS file buffers, any increase in MAXFILES after strings have been concatenated will destroy these strings. You must change MAXFILES as one of the first commands in a program.

DOS automatically establishes buffers for three text files. This allows us to have three text files open at one time. Most often, a program will require access to only one file at a time. Applesoft provides a command to allow us to adjust the number of file buffers available. Since each buffer must contain 595 bytes (256 bytes of data plus the other information shown in Figure 1), we can get over 1K free just by eliminating the two file buffers we don't need. To demonstrate this, type in the program listing and run it. The following pairs of values will appear on-screen:

38400 (Top of memory)

36098 (Free space)

38995

36693

39590

37288

38400

36098

```

10 HOME
20 PRINT PEEK(115) + 256 * PEEK(116)
30 PRINT 65535 + FRE(0)
40 PRINT
50 PRINT CHR$(4); "MAXFILES 2"
60 PRINT PEEK(115) + 256 * PEEK(116)
70 PRINT 65535 + FRE(0)
80 PRINT
90 PRINT CHR$(4); "MAXFILES 1"
100 PRINT PEEK(115) + 256 * PEEK(116)
110 PRINT 65535 + FRE(0)
120 PRINT
130 PRINT CHR$(4); "MAXFILES 3"
140 PRINT PEEK(115) + 256 * PEEK(116)
150 PRINT 65535 + FRE(0)

```

*Listing. This demonstrates how you can increase memory by eliminating file buffers.*

These pairs represent respectively the top of user memory (HIMEM:) and the available free space (from the top of our short program to HIMEM:) for various values of MAXFILES. The top pair is the default value for MAXFILES, which is three. The other pairs show the values for a subsequent reduction of file buffers from three to two to one and back to three. As you can see by comparing the values, every time we reduce MAXFILES by one, removing a file buffer, we move the top of memory up 595 bytes and in-



Apple Mechanic's hi-res type routines and fonts are usable in your programs WITHOUT LICENSING FEE. Just give Beagle Bros credit on your disk and documentation.

## APPLE MECHANIC

HI-RES SHAPE EDITOR / TYPE FONT DISK  
by BERT KERSEY

\$29.50: Includes Peeks/Pokes Chart & Tip Book #5.

**SHAPE EDITOR:** Keyboard-draw hi-res shapes for animation in your Applesoft programs. Access & create proportionally-spaced hi-res Typefaces with each character re-definable as you want. Six fonts are included on the disk. Excellent LISTable Applesoft demos show you how to animate graphics and create professional-looking Charts and Graphs.

**BYTE-ZAP:** Rewrite any byte on a disk for repair or alteration. Load entire sectors on the screen for inspection. Hex/Dec/Ascii displays and input. Educational experiments included for making trick file names, restoring deleted files, changing DOS, etc.

**MORE:** Useful music, text and hi-res tricks for your programs. Clear educational documentation.

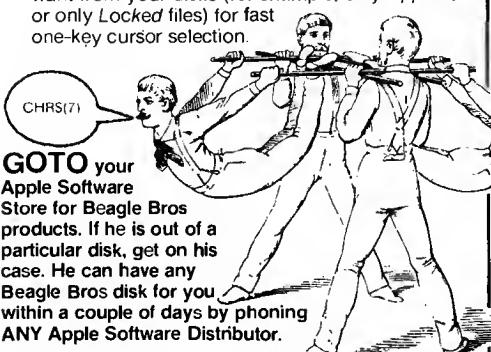
## APPLE MECHANIC TYPEFACES

by BERT KERSEY

\$20.00: Includes Peeks & Pokes Chart.

**26 NEW FONTS** for use with Apple Mechanic programs. Many different sizes and typestyles, both ordinary and Artistic. Every character—from A to Z to "\*" to "□"—of every typeface—from "Ace" to "Zooloo"—is re-definable to suit your needs. All typefaces are proportionally spaced for a more professional appearance. People do notice the difference!

**BEAGLE MENU:** Display only the file names you want from your disks (for example, only Applesoft or only Locked files) for fast one-key cursor selection.



**RUSH** the following disks by First Class Mail—

<input type="checkbox"/> Alpha Plot .....	\$39.50	<input type="checkbox"/> Frame-Up .....	\$29.50
<input type="checkbox"/> Apple Mechanic .....	29.50	<input type="checkbox"/> GPLE .....	49.95
<input type="checkbox"/> A.M Typefaces .....	20.00	<input type="checkbox"/> ProntoDOS .....	29.50
<input type="checkbox"/> Beagle Bag .....	29.50	<input type="checkbox"/> Silicon Salad .....	24.95
<input type="checkbox"/> Beagle BASIC .....	34.95	<input type="checkbox"/> Tip Disk #1 .....	20.00
<input type="checkbox"/> DiskQuik .....	29.50	<input type="checkbox"/> Utility City .....	29.50
<input type="checkbox"/> DOS Boss .....	24.00	<input type="checkbox"/> ADD ME to mailing list	
<input type="checkbox"/> Double-Take .....	34.95	<input type="checkbox"/> ALREADY ON mail list	
<input type="checkbox"/> Flex Type .....	29.50		

**AT YOUR APPLE DEALER NOW!**  
Or order directly from Beagle Bros—



Visa/MasterCard or COD, call TOLL-FREE

Orders only / ALL 50 STATES / 24 Hours a Day

**1-800-227-3800 ext. 1607**

OR mail U.S Check, Money-Order or Visa/MC#  
to **BEAGLE BROS**, 8th Floor

4315 SIERRA VISTA, SAN DIEGO, CA 92103

Add \$1.50 First Class Shipping. Any-Size Order  
Overseas add \$4.00 COD add \$3.00 California add 6%  
ALL ORDERS SHIPPED IMMEDIATELY.

AD#8A Circle 179 on Reader Service card.

88 Cider May 1984

## DOS BOSS

DISK COMMAND EDITOR

by BERT KERSEY and JACK CASSIDY

\$24.00: Includes Peeks/Pokes Chart & Tip Book #2.

**RENAME DOS COMMANDS** & Error Messages—"Catalog" can be "Cat"; "Syntax Error" can be "Oops" or almost anything you want it to be.

**PROTECT YOUR PROGRAMS.** An unauthorized Save-attempt can produce a "Not Copyable" message, or any message you want. Also easy List-Prevention and other useful Apple tips and tricks. Plus one-key program-execution from catalog.

**CUSTOMIZE DOS.** Change the catalog Disk Volume heading to your message or title. Omit or alter catalog file codes. Fascinating documentation, tips and educational Apple experiments.

**ANYONE USING YOUR DISKS** (booted or not) will be using DOS the way YOU designed it.



10 LIST: LIST: LIST: FOR ZZ=PEEK(175)+PEEK(176)\*256+36 TO 3072: POKE ZZ,216: NEXT 20 FOR XXX=1 TO 2: POKE-162990: POKE -163000: XXX=1: NEXT: REM Experiment with different length variable names.

## BEAGLE BAG

12 APPLE GAMES ON ONE DISK

by BERT KERSEY

\$29.50: Includes Peeks & Pokes Chart

**COMPARE BEAGLE BAG** with any single-game Locked-Up disk on the market today.

All 12 games are a blast, the price is a bargain, the instructions are crystal clear, and the disk is COPYABLE. You can even change the programs or list them to learn programming tricks by seeing how they work.

**TWELVE GAMES** from the Applesoft Ace, Bert Kersey—TextTrain, Wowzo, Magic Pack, Buzzword, Slippery Digits, and many many more...

**EXCELLENT REVIEWS**—See Jan-83 Softalk, p.148. Beagle Menu too: see Typefaces description.



**Beagle Bros**  
Micro Software Inc.

4315 SIERRA VISTA / SAN DIEGO, CA 92103  
619-296-6400

**ALL BEAGLE DISKS ARE UNLOCKED, COPYABLE AND COMPATIBLE WITH APPLE II, II+ AND Ile.\* (Don't Settle for Less!)**

\*DISKQUIK requires Apple IIe.

"APPLE" is a Registered Trade Mark of You-Know-Who.

## NEW! SILICON SALAD

INCLUDING TIP DISK #2

by BERT KERSEY and MARK SIMONSEN

\$24.95: Includes Peeks/Pokes AND Commands Charts

**MANY MINI-UTILITIES:** Disk Scanner finds bad disk sectors, Key-Clicker adds subtle sound as you type, DOS-Killer adds two tracks of space to your disks, 2-Track Cat allows up to 210 file names per disk, Program Splitter makes room for hi-res pix with large Applesoft programs, Text Imprinter transfers text to the hi-res screen, Onerr Tell Me prints the appropriate error message but continues program execution, Text Screen Formatter converts text layouts into Print statements... plus much more Apple wizardry from the boys at Beagle Bros.

**MORE TIPS ON DISK:** Including fantastic programming tricks from Beagle Bros Tip Books 5, 6 and 7, plus programs from Tips/Tricks Chart #1.

**TWO-LINERS TOO:** From our customers around the world—and elsewhere. Little mind-blowers that will teach your old Apple some new tricks!

## TIP DISK #1

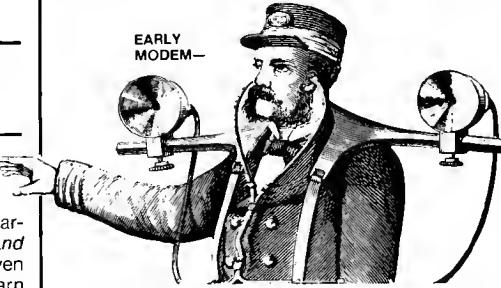
100 TIP BOOK TIPS ON DISK

by BERT KERSEY

\$20.00: Includes Peeks & Pokes Chart

**100 LISTABLE PROGRAMS** from Beagle Bros Tip Books 1-4. Make your Apple do things it's never done! All 100 programs are LISTable and changeable for Apple experimentation.

**COMMAND CHART INCLUDED:** Free with each Tip Disk; an 11 x 17 poster of all Applesoft, Integer Basic & DOS Commands with Descriptions!



## FLEX TYPE

(FORMERLY "FLEX TEXT")

VARIABLE-WIDTH HI-RES TEXT UTILITY

by MARK SIMONSEN

\$29.50: Includes Peeks & Pokes Chart

**PRINT VARIABLE-WIDTH TEXT** on both hires screens with normal Applesoft commands (including HTAB 1-70). Normal, expanded & compressed text with no extra hardware. (70-column text requires a monochrome monitor, not a tv).

**ADD GRAPHICS TO TEXT** or add Text to hi-res graphics. Run your existing Applesoft programs under Flex Type control. Fast, easy to use, and Compatible with GPLE and Double-Take.

**DOS TOOL KIT\*** font compatibility, or use the supplied Flex Type typefaces. Select up to 9 fonts with control-key commands. A text character editor lets you redesign any Apple text character.

## FRAME-UP

FAST APPLE DISPLAY UTILITY

by TOM WEISCHAAR

\$29.50: Includes Peeks & Pokes Chart

**PROFESSIONAL PRESENTATIONS:** Turn your existing Hi-Res, Lo-Res and Text frames into attractive Apple "slide shows". FAST hi-res loads in 2½-seconds! Paddle or Keyboard-advance frames.

**UNATTENDED SHOWS** are optional, with each picture arranged and pre-programmed to display on the screen from 1 to 99 seconds. Custom Text Screen Editor lets you create black-and-white text "slides" and add type "live" from the keyboard during shows. Mail copies of presentations on disk to your friends and associates (or home to Mom!).

**NEW!** **GPLE**  
GLOBAL PROGRAM LINE EDITOR  
by NEIL KONZEN

\$49.95: Includes Peeks/Pokes Chart & Tip Book #7.

**A CLASSIC APPLE PROGRAM EDITOR**  
GPLE lets you edit Applesoft program lines **FAST** without awkward cursor-tracing and "escape editing".

**INSERT & DELETE:** GPLE works like a word processor for Applesoft program lines. You make changes instantly by jumping the cursor to the change point and inserting or deleting text. No need to trace to the end of a line before hitting Return.

**GLOBAL SEARCH & REPLACE:** Find any word or variable in your programs, **FAST**. For example, find all lines containing a GOSUB, or edit or delete all lines with REM statements, or all occurrences of any variable. Replace any variable, word or character with any other. For example, change all X's to ABC's, or all "Horse" strings to "Cow".

**80-COLUMN COMPATIBILITY:** All edit & global features support Apple IIe 80-column cards and most 80-column cards on any Apple IIe, II+ or II.

**DEFINABLE ESC FUNCTIONS:** Define ESC plus any key to perform any task. For example, **ESC-1** can catalog drive 1, **ESC-L** can do a "HOME LIST", **ESC-N** could type an entire subroutine... Anything you want, whenever you want.

**GPLE DOS MOVER:** Move DOS and GPLE to Language Card (or IIe upper 16K) for an **EXTRA 10,000 Bytes** (10K) of programmable memory.

**Plus APPLE TIP BOOK #7:** Learn more about your Apple! Includes all new GPLE tips and tricks.



**UTILITY CITY**  
21 PROGRAMMING UTILITIES  
by BERT KERSEY

\$29.50: Includes Peeks/Pokes Chart & Tip Book #3.

**LIST FORMATTER** prints each program statement on a new line. Loops indented with printer Page Breaks. A great Applesoft program de-bugger.

**MULTI-COLUMN CATALOGS**, with or without sector and file codes. Organize your disk library.

**INVISIBLE** and trick catalog file names. Invisible functioning commands in Applesoft programs too.

**MUCH MORE:** 21 utilities, including auto-post Run-number & Date in programs, alphabetize/store info on disk, convert dec to hex or Int to FP, protect and append programs, dump text to printer...

**LEARN PROGRAMMING:** List-able programs and informative documentation. Includes Tip Book #3. Hours of good reading & Applesoft experiments.

**ALPHA PLOT**  
HI-RES GRAPHICS/TEXT UTILITY  
by BERT KERSEY and JACK CASSIDY

\$39.50: Includes Peeks/Pokes Chart & Tip Book #4.

**DRAW IN HI-RES** on both Apple "pages" using easy keyboard commands OR paddles/joystick. Pre-view lines before plotting. Solid or mixed colors & Reverse (background-opposite) drawing. FAST one-keystroke circles, boxes & ellipses, filled or outlined. Add text for graphs & charts. All pix Save-able to disk, to be called from your Applesoft programs.

**COMPRESS HI-RES DATA** to 1/3 disk space (average) allowing more hi-res pictures per disk.

**MANIPULATE IMAGES:** Superimpose any two images, or RE-LOCATE any rectangular section of any drawing anywhere on either hi-res page.

**HI-RES TYPE:** Add text to your pictures with adjustable character-size and large-character color. Type anywhere with no Htab/Vtab limits. Type sideways too, for graphs. Includes Tip Book #4.



**Beagle Bros**  
Micro Software Inc.

4315 SIERRA VISTA / SAN DIEGO, CA 92103  
619-296-6400

**ALL BEAGLE DISKS ARE UNLOCKED, COPYABLE AND COMPATIBLE WITH APPLE II, II+ AND IIe.\***  
(Don't Settle for Less!)

\* DISKQUIK requires Apple IIe.

"APPLE" is a Registered Trade Mark of You-Know-Who.

**BEAGLE BASIC**  
APPLESOFT ENHANCER  
by MARK SIMONSEN

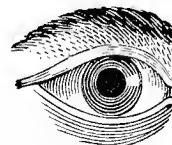
\$34.95: Includes Peeks/Pokes Chart & Tip Book #6.  
Requires Apple IIe (OR II/II+ with RAM Card).

**RENAME ANY APPLESOFT COMMAND** or Error Message to anything you want. For program clarification, encryption/protection or even foreign translation. Plus add optional NEW COMMANDS:

**ELSE** follows If-Then statements, like this:  
IF X=2 THEN PRINT "YES": ELSE PRINT "NO"

**HSCRN** reads color of any hi-res dot for collision testing. **SWAP X,Y** exchanges 2 variables' values. New **TONE** command writes music with no messy pokes & calls. **SCRL** scrolls text in either direction. **TXT2** lets Text Page 2 act exactly like Page 1.

**PLUS:** GOTO & GOSUB may precede variables, as in "GOSUB FIX" or "GOTO 4+X". Escape-mode indicated by special ESC CURSOR. Replace awkward Graphics screen-switch pokes with 1-word commands. Change ctrl-G Beep to any tone. **INVERSE REMS** too! All GPLE compatible.



1 FOR S-768 TO 773: READ A:  
POKE S,A: NEXT: POKE 232,0:  
POKE 233,3: DATA 1,0,4,0,5,0  
2 HGR2: FOR R=0 TO 192: ROT=R:  
SCALE=.96: XDRAW 1 AT 140.95:  
SCALE=.30: XDRAW 1 AT 140.95:  
S-PEEK(49200): NEXT: RUN

**PRONTO-DOS**  
HIGH-SPEED DOS / DOS-MOVE UTILITY  
by TOM WEISHAAR

\$29.50: Includes Peeks & Pokes Chart

**TRIPLES THE SPEED** of disk access and frees 10,000 bytes of extra memory by moving DOS.

**Function** **Normal Pronto**  
BLOAD HI-RES IMAGE ..... 10 sec. 3 sec.  
LOAD 60-SECTOR PROGRAM ..... 16 sec. 4 sec.  
SAVE 60-SECTOR PROGRAM ..... 24 sec. 9 sec.  
BLOAD LANGUAGE CARD ..... 13 sec. 4 sec.  
(Text Files: No Change)

Boot the Pronto disk or your updated disks, created with the normal INIT command. Compatible with all DOS Commands, GPLE, Double-Take, DOS Boss, DiskQuik and almost all unprotected programs.

**MOVE DOS** to your Language Card, RAM Card, or standard Apple IIe upper 16K, freeing up **10,000 EXTRA BYTES** of memory for your programs.

**15 EXTRA SECTORS** per disk. Catalog Free-Space displayed every time you catalog a disk.

**TYPE-COMMAND** ("TYPE filename") prints contents of sequential Text Files on screen or printer.

**NEW!** **DISKQUIK**  
DISK DRIVE EMULATOR  
by HARRY BRUCE and GENE HITE

\$29.50: Includes Peeks & Pokes Chart  
Requires Apple IIe with Extended 80-column Card.

**ACTS LIKE A DISK DRIVE** in Slot 3, but much faster, quieter, more reliable and \$350+ cheaper! Enjoy the benefits of a 2nd (or 3rd or 4th...) drive at less than 1/10th the price. Catalogs normally with "CATALOG, S3" command. Load & Save any kind of files into RAM with normal DOS commands.

**SILENT AND FAST:** Since no moving parts are involved, DiskQuik operates silently and at super-high speeds. See it to believe it. Your Apple IIe's Extended 80-column Card (required) can hold about half the amount of data as a 5 1/4" floppy disk!

**MANY USES:** For example, auto-load often-used files like FID etc., etc., into RAM when you boot up, so they are always available when you need them. Copy files from RAM onto disk and vice versa, just as if a disk drive were connected to slot #3.

**FRIENDLY & COMPATIBLE** with 80-column display, GPLE, ProntoDOS, and all normal Applesoft and DOS commands and procedures. Will not interfere with Apple IIe "Double Hi-Res" graphics.

**GOTO** any Software Store for Beagle Bros. If they are out of a particular disk, remember to return to get on the stick, and call Beagle Bros. 4315 Sierra Vista, San Diego, CA 92103. Telephone: 619-296-6400. Distributorships available. Every disk we sell is to Uncle Lou. Our disks are unprotectable. They are unprotected floppies with write protection everywhere but the label.

**DOUBLE-TAKE**  
2-WAY-SCROLL/MULTIPLE UTILITY  
by MARK SIMONSEN

\$34.95: Includes Peeks/Pokes AND Tips/Tricks Charts.

**2-WAY SCROLLING:** Listings & Catalogs scroll Up AND Down, making file names and program lines much easier to access. Change the Catalog or List scroll-direction at will, with Apple's Arrow keys.

**80-COLUMN COMPATIBLE:** All features support IIe and most other 80-column cards.

**BETTER LIST FORMAT:** Each program statement lists on a new line for **FAST** program tracing & de-bugging. Printer-compatible; any column-width.

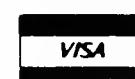
**VARIABLE-DISPLAY:** Displays all of a program's strings and variables with current values.

**CROSS-REFERENCE:** Sorts and displays line numbers where each variable & string appears.

**AUTO-LINE-NUMBER**, Hex/Dec Converter, better Renumber/Append, Program Stats, Change Cursor, Space-On-Disk. GPLE/Pronto compatible.

<input type="checkbox"/> Alpha Plot	\$39.50	<input type="checkbox"/> Frame-Up	\$29.50
<input type="checkbox"/> Apple Mechanic	29.50	<input type="checkbox"/> GPLE	49.95
<input type="checkbox"/> A.M.Typefaces	20.00	<input type="checkbox"/> ProntoDOS	29.50
<input type="checkbox"/> Beagle Bag	29.50	<input type="checkbox"/> Silicon Salad	24.95
<input type="checkbox"/> Beagle BASIC	34.95	<input type="checkbox"/> Tip Disk #1	20.00
<input type="checkbox"/> DiskQuik	29.50	<input type="checkbox"/> Utility City	29.50
<input type="checkbox"/> DOS Boss	24.00	<input type="checkbox"/> ADD ME to mailing list	
<input type="checkbox"/> Double-Take	34.95	<input type="checkbox"/> ALREADY ON mail list	
<input type="checkbox"/> Flex Type	29.50		

**AT YOUR APPLE DEALER NOW!**  
Or order directly from Beagle Bros.—



Visa/MasterCard or COD, call **TOLL-FREE**  
Orders only / ALL 50 STATES / 24 Hours a Day

**1-800-227-3800 ext. 1607**

OR mail U.S.Check, Money-Order, or Visa/MC#  
to **BEAGLE BROS.**, 7th Floor

4315 SIERRA VISTA, SAN DIEGO, CA 92103

Add \$1.50 First Class Shipping. Any-Size Order.  
Overseas add \$4.00 COD add \$3.00. California add 6%  
ALL ORDERS SHIPPED IMMEDIATELY.

CLIP COUPON OR USE SEPARATE SHEET.

crease the amount of available memory by 595 bytes. Thus, if we will only need one text file open at a time, we can gain an extra 1190 ( $2 \times 595$ ) bytes of memory by setting MAXFILES to 1.

### Moving DOS

If you have a language card (16K RAM card) or an Apple IIe, 16K bytes of read/write memory (RAM) occupy the same address locations as the Applesoft ROM. When you boot the DOS 3.3 system master, Integer Basic loads into this extra memory so that you can switch between the two languages. Because language card addresses are the same as the addresses of the Applesoft ROMs, it is unavailable to the user under normal conditions and is therefore largely unused. Since DOS occupies only a little over 10K bytes in its usual form, it will fit nicely on the language card. This frees an additional 10K of user memory. Since DOS is software, it can easily be modified to occupy those addresses. Several commercial programs can move DOS to the language card. In addition, *Call A.P.P.L.E.* (July/August 1981) published a program that accomplishes this. The advantage to this technique, of course, is that more free space is available to the program so that more strings may be stored and less garbage collection is required.

### Faster DOS

Obviously, since DOS is in software, we can also modify the existing software to handle text files more rapidly. We must forego DOS's extra care in handling such files, but this is a small price to pay for significant increases in speed. The two sources of DOS modifications are magazine articles and commercial programs. The "Further Reading" section below lists some magazine articles that provide means of modifying DOS. Look through the advertisements in this magazine for commercial programs. Remember that the program must modify the TEXT handling characteristics of DOS, not just the LOAD and BLOAD characteristics.

### Skewing Again

I mentioned disk sector skewing in Part 1 of this series. Skewing is one of

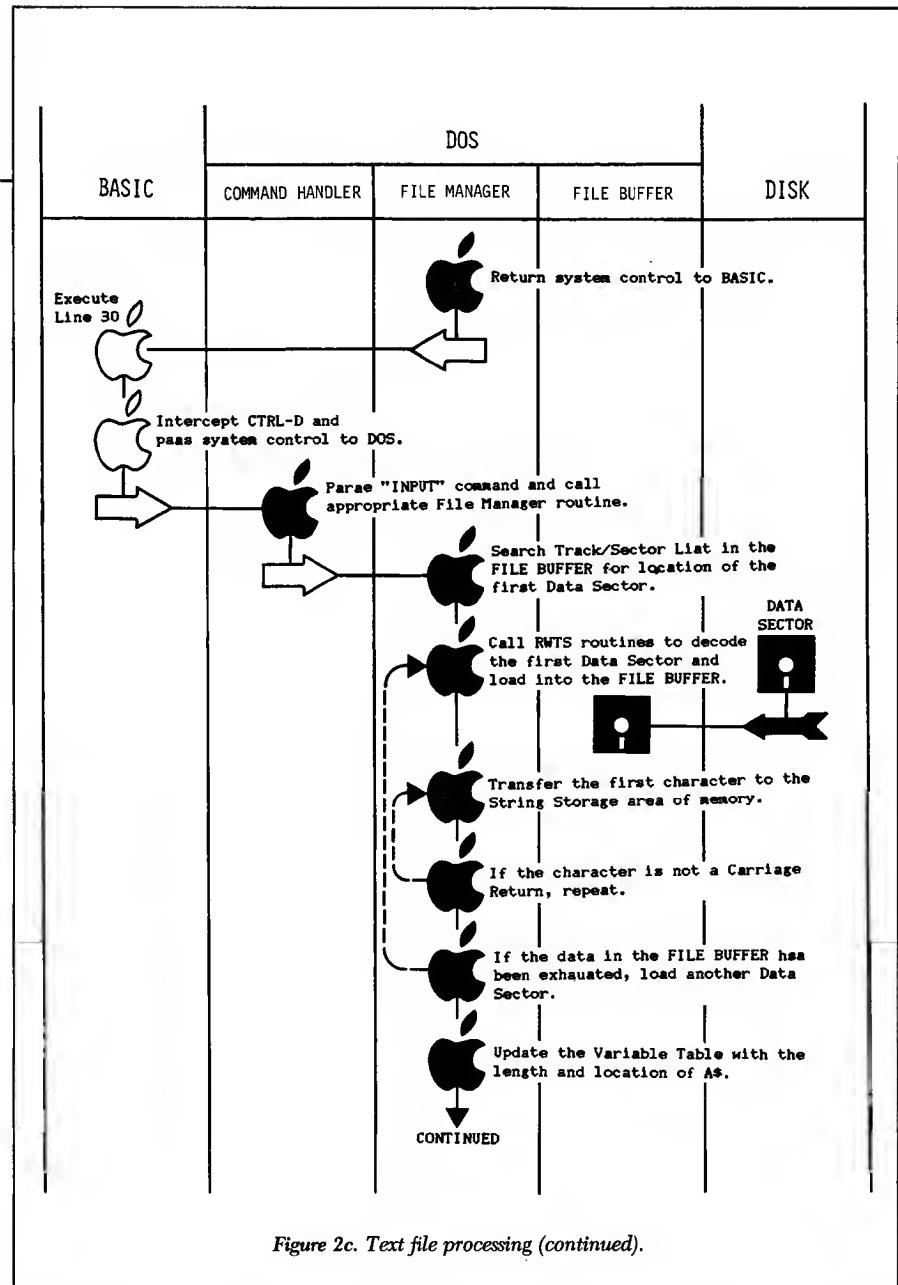


Figure 2c. Text file processing (continued).

the reasons disk operations are so slow.

Imagine the disk as a merry-go-round with 16 horses, each horse representing one disk sector. Number the horses, beginning with 1 and numbering every seventh horse afterwards (the first horse is 1, the eighth is 2, the fifteenth is 3, and so on). Whenever you pass horse number 1, skip it in your counting scheme. When you finish, you will have been around the merry-go-round seven complete times; the horses will be numbered 1, 14, 12, 10, 8, 6, 4, 2, 15, 13, 11, 9, 7, 5, 3, 16. Now stand with a box full of balls looking at horse 1 and start your merry-go-round rotating. Take a ball and throw it at horse number 1. Take another and throw it at horse number 2. Note that six horses passed you while you were picking up the second ball. Just as

skewing the numbers on the horses gave you time to pick up the second ball, skewing sectors gives DOS time to process incoming or outgoing data from one sector before the next sector passes the read/write head. But just to make sure that the computer has plenty of time, DOS waits six sectors before it reads the next sector.

This is the way DOS accesses the disk—read or write one sector, skip six, read or write another sector, skip six. True, the disk spins at 300 rpm, but it still takes seven revolutions (1.4 seconds) to read one track.

If the computer is really waiting for the disk to rotate, why not read sectors in their physical order or, at worst, skip only one sector instead of six? Only one or two revolutions would be required to read a track. Good idea, and

# CHART YOUR PROGRESS

## SPECIALS OF THE MONTH

Micromodem IIe w/Smartcom .....	\$259
Volksmodem .....	\$ 64
Grappler + .....	\$129
Koala Touch Tablet .....	\$ 89
Chalkboard Power Pad w/Starter Kit	\$109
Apple II Computer Cover .....	\$ 6.50
Flip & File (holds 50) .....	\$22.50
Verbatim Disks S/D .....	\$26.00
Verbatim Twin Pack .....	\$ 6.00
Wico Analog Joystick .....	\$36.00

## HARDWARE SPECIALS

### Printers

#### C Itoh

F510 Prowriter .....	\$399
F10 Starwriter .....	\$1349
F10 Printmaster .....	\$1529

#### Okidata

ML82A .....	Call
ML83A .....	Call
ML84P .....	Call
ML84S .....	Call
ML92P .....	Call
ML93P .....	Call

### Monitors

Amdek Color I+ .....	\$315
Amdek 300 Green .....	\$169
Amdek 310A Amber .....	\$189
Leading Edge Gorilla	
Hi-Res Green/	
Amber 12" .....	\$ 89

## RECREATION

Creature Creator .....	\$ 29
Sargon III .....	\$ 36
Witness .....	\$ 36
Planetfall .....	\$ 36
Starcross .....	\$ 29
Zork I, II, III .....	Ea. \$ 29
Enchanter .....	\$ 36
Deadline .....	\$ 36
Suspended .....	\$ 36
The Quest .....	\$ 17
Zero Gravity Pinball .....	\$ 22
Sammy Lightfoot .....	\$ 29
Apple Cider Spider .....	\$ 25
Sargon II .....	\$ 25
Crypt of Medea .....	\$ 25
Knight of Diamonds .....	\$ 25
Wizardry .....	\$ 35
Legacy of Lylgamyn .....	\$ 29
Lode Runner .....	\$ 25
Choplifter .....	\$ 25
Temple of Apsai .....	\$ 29
Castle of Wolfenstein .....	\$ 29
Spare Change .....	\$ 29
Tigers in The Snow .....	\$ 29
Flight Simulator II .....	\$42
Geopolitique 1990 .....	\$29
J-Bird .....	\$27
Broadsides .....	\$29
Eagles .....	\$29
Oil Barons .....	\$39



Information and Inquiries:  
(702) 796-0296 Order  
Status: (702) 369-5523.

## EDUCATION

Sticky Bear Numbers .....	\$ 30
Sticky Bear ABC/ .....	\$ 30
In Search of the	
Most Amazing Thing .....	\$ 29
Hey Diddle Diddle/	
Spinnaker .....	\$ 22
Snooper Troops #1/	
Spinnaker .....	\$ 32
Snooper Troops #2/	
Spinnaker .....	\$ 32
Delta Drawing/	
Spinnaker .....	\$ 35
Story Machine/Spinnaker	\$ 27
Face Maker/Spinnaker ..	\$ 27
Rhymes & Riddles/	
Spinnaker .....	\$ 27
PLATO Whole Numbers ..	\$ 39
PLATO Decimals .....	\$ 39
PLATO Fractions .....	\$ 39
Alien Counter/	
Face Flash/Milliken .....	\$ 26
Gulp & Arrow .....	
Graphics/Milliken .....	\$ 26
Juggles Rainbow/	
Learning Co. .....	\$ 22
Bumble Games/	
Learning Co. .....	\$ 29
Bumble Plot/	
Learning Co. .....	\$ 29
Gertrudes Secrets/	
Learning Co. .....	\$ 32
Gertrudes Puzzles/	
Learning Co. .....	\$ 32
Rocky's Boots/	
Learning Co. .....	\$ 36
Compu-Read/Edu-Ware ..	\$ 25
Spelling Bee w/	
Reading Primer .....	\$ 29
Algebra I/Edu-Ware .....	\$ 36
Fractions/Edu-Ware .....	\$ 36
Decimals/Edu-Ware .....	\$ 36
Master Type/Lightning ..	\$ 29
Type Attack/Sirius .....	\$ 29
New Step by Step/PDI ..	\$ 59
Word Attack/Davidson ..	\$ 36
Math Blaster/Davidson ..	\$ 36
Speed Reader II/Davidson ..	\$ 45
Spellicopter/Designware ..	\$ 27
Micro Multiplication/	
Hayden .....	\$ 20
Songwriter/Scarborough ..	\$ 29
Picturewriter/Scarborough ..	\$ 29
Koalagrams Spelling I ..	\$ 29
Spidereater/Koala .....	\$ 22
Mathmaze/Designware ..	\$ 29
SAT/Harcourt Brace .....	\$ 59

## BUSINESS

### BRODERBUND

The Bank Street Writer ..	\$ 49
The Bank Street Speller ..	\$ 49

### CONTINENTAL SOFTWARE

The Home Accountant ..	\$ 48
F.C.M. .....	\$ 62
G/L, A/R, A/P,	
Payroll .....	Ea. \$159
CPA Module No. 5-	
Property Mgmt. .....	\$305

### HOWARD SOFTWARE

Creative Financing .....	\$159
Real Estate Analyzer II ..	\$139
Tax Preparer 1983 .....	\$199

### IUS

Professional Easywriter ..	\$125
Original Easywriter .....	\$ 72
Pro. Easywriter/	
Mailer Combo .....	\$215
Orig. Easywriter/	
Mailer Combo .....	\$ 99

### MONOGRAM

Dollars & Sense .....	\$ 72
-----------------------	-------

### MICRO LAB

The Tax Manager 1983 ..	\$129
Data Factory 5.0 .....	\$215
Payroll Manager .....	\$215

### MICRO PRO (All Reg. Z-80)

Wordstar .....	\$259
Infostar .....	\$259
Reportstar .....	\$229
4 Pak Word-Mail-	
Spell-Star .....	\$459

### SIERRA ON-LINE

Homeword .....	\$ 36
Screenwriter II .....	\$ 95
The Dictionary .....	\$ 72
Screenwriter Professional	\$145
The General Manager II	\$169

### PBL CORPORATION

Personal Investor .....	\$105
-------------------------	-------

### SILICON VALLEY

Word Handler II .....	\$ 45
List Handler .....	\$ 39
"The Handlers" .....	\$ 85

### SOFTWARE PUBLISHING

PFS: File .....	\$ 85
PFS: Report .....	\$ 85
PFS: Graph .....	\$ 85

# Computer Outlet

1095 East Twain, Las Vegas, NV 89109 Mon.-Fri. 8 a.m. to 6 p.m., Sat. 9 a.m. to 5 p.m.



1-800-634-6766



SHIPPING: For fast delivery, cashier checks, money orders or direct bank wires. Personal and company checks, allow 3 weeks to clear. C.O.D. charges: \$3 minimum or 1% on orders over \$300. Nevada residents add 5% sales tax. Shipping charges based on weight \$3 minimum. APO and FPO orders: \$10 minimum and 15% on all orders over \$100. School and business purchase orders welcome. All returns must be accompanied by return authorization number. Call (702) 369-5523 before returning goods for replacement. Prices reflect cash discount only and are subject to change. Catalogs: .50¢ U.S., \$1.00 foreign.

## AMPERGRAPH

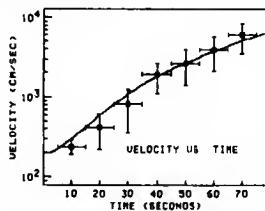
AMPERGRAPH is a powerful, easy-to-use relocatable graphics utility for the Apple II +/A. AMPERGRAPH adds twenty-two Applesoft commands that allow effortless generation of professional-looking plots of scientific or financial data. All of the necessary scaling and screen formatting is accomplished with just a few, simple Applesoft lines.

Unlike most other plotting systems for the Apple II which are stand-alone systems, the AMPERGRAPH utility provides extended BASIC graphics language macros that you can use directly in your own Applesoft programs. The additional commands are &SCALE, &LIMIT, &AXES, &GRID, &FRAME, &LOG X, &LOG Y, &LABEL AXES, &LABEL, &VLABEL, &CENTER LABEL, &CENTER VLABEL, &DRAW, &PENUP, &CROSS, &OPEN SQUARE, &CLOSED SQUARE, &OPEN CIRCLE, &CLOSED CIRCLE, &ERROR BARS, &DUMP (to dump the graph on a Silentype printer) and &\*DUMP (to link with AMER-DUMP, see below).

\$45.00

## SAMPLE AMPERGRAPH PROGRAM LISTING:

```
10 &SCALE, 0, 80, 80, 13000
15 LX$ = "TIME (SECONDS)":LY$ = "VELOCITY
(CM/SEC)"
20 &LOG Y: &LABEL AXES, 10, 10
25 LABEL$ = "VELOCITY VS. TIME":&LABEL, 30,
200
30 FOR T = 0 TO 80:&DRAW, T, 150 + T12:NEXT T
35 FOR T = 10 TO 70 STEP 10
40 &CLOSED SQUARE, T,
(150 + T12)*(.8 + .4 * RND(3))
45 &ERROR BARS, 5, T12/2
50 NEXT T:&DUMP
```



## AMPERDUMP

AMPERDUMP is a high-resolution graphics dump utility which can be used either in menu-driven mode, or directly from your Applesoft program, with, or without AMPERGRAPH. The following printers will work with AMPERDUMP: Epson MX-80, FX-80, MX-100; Apple DMP, NEC PC-8023A-C, C, ITOH 1550, 8510A/B, 8600. AMPERDUMP offers many features which are not available in other graphics dump routines:

- Horizontal magnifications: 3 with Epson printers (2.33 to 6.99 inches); 12 with all others (1.75 to 7.78 inches)
- Vertical magnifications: 9 with Epson printers (0.88 to 7.96 inches); 6 with all others (1.33 to 8.00 inches)
- Horizontal and vertical magnifications can be specified independently.
- Normal / Inverse dumps
- Adjustable horizontal tab
- Compatible with AMPERGRAPH
- Fast
- Easy to use
- Relocatable

\$40.00

The AMPERGRAPH and AMPERDUMP graphics utilities require an Apple II +/e (or Apple II with language card). The AMPERDUMP utility requires one of the following interface cards: Epson, Apple, Grappler, Interactive Structures, Mountain Computer, Epson Type2, Tymac, or Microbuffer II.

AMPERGRAPH and AMPERDUMP are available from your dealer or order direct. Include \$2.00 for shipping and handling; Wisconsin residents add 5% sales tax.

**madWest**  
SOFTWARE

121 N. Allen St.  
Madison, WI 53705



608-238-4875

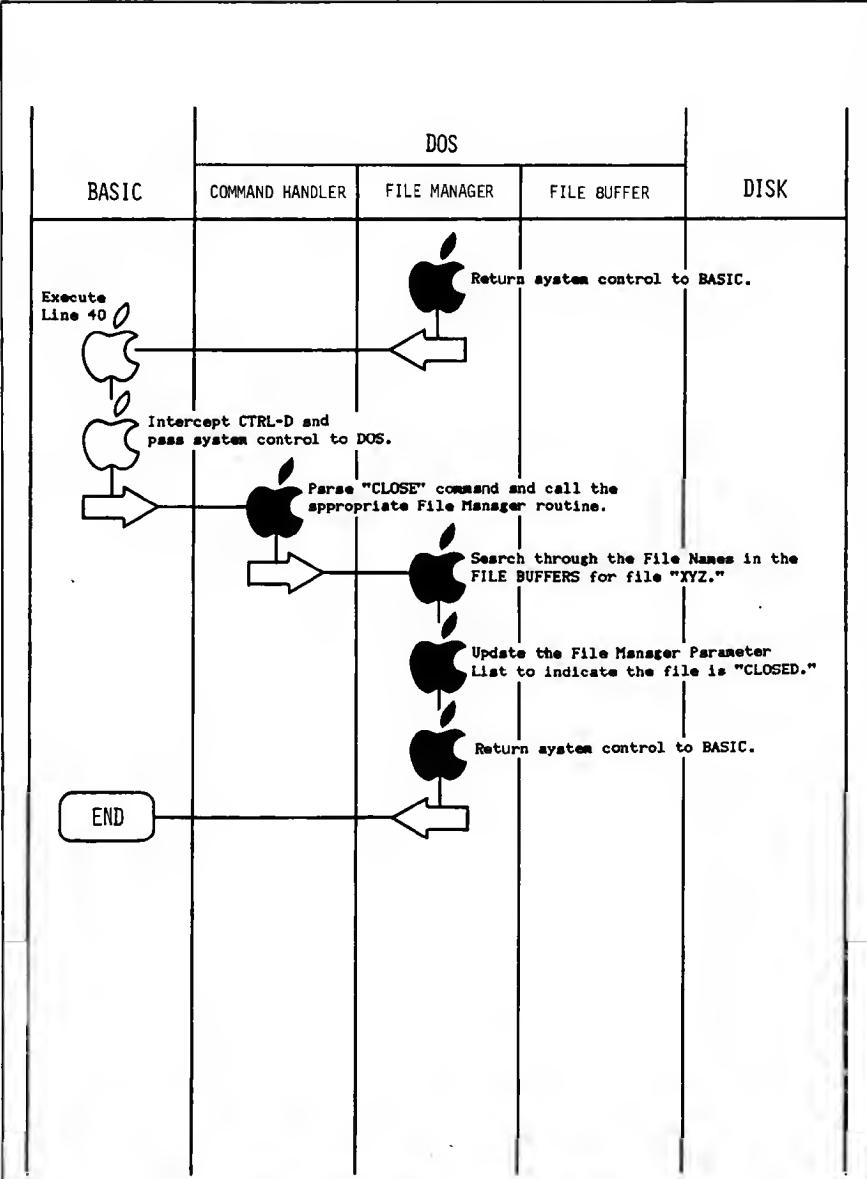


Figure 2d. Text file processing (concluded).

various schemes have been devised to do just that (see "Oiler" in *Nibble*, Volume 3, Number 5). Unfortunately, this scheme just won't work for text files.

Figure 2 shows that text files are handled one byte at a time. Memory space must be allocated for the string, the string must be processed into that memory space and the variable table must be updated—a very slow process. As a result, the extra disk rotation is required to allow time for DOS to process each sector of text—maybe even more if garbage collection is required.

To speed up text file reads and writes, we must be able to bypass the file manager to load text files directly into memory—a highly critical operation. See "Further Reading" for programs that speed text file handling.

### Further Reading

- "Text File Fast Loader," *All About DOS*, A.P.P.L.E.
- "Amper Reader," *Nibble*, Volume 2, Number 1.
- "Amper-speed," *Nibble*, Volume 3, Number 3.
- "Saving and Loading Arrays in Applesoft," *Apple Orchard*, Winter 1980.
- "Amper Disk Storage and Recall," *Nibble*, Volume 2, Number 6.

### More to Come

Next month, we will look at text files themselves and relate them to the information we have learned so far about the computer. In the meantime, have some random thoughts about the sequence of information we have discussed so far. ■



# SANYO MONITOR SALE!!



- 80 Columns x 24 lines
- Green text display
- Easy to read - no eye strain
- Up front brightness control
- High resolution graphics
- Quick start - no preheating
- Regulated power supply
- Attractive metal cabinet
- UL and FCC approved

## 9" Data Monitor

- **15 Day Free Trial - 90 Day Immediate Replacement Warranty**

9" Screen - Green Text Display	*\$ 69.00
12" Screen - Green Text Display (anti-reflective screen)	*\$ 99.00
12" Screen - Amber Text Display (anti-reflective screen)	*\$ 99.00
14" Screen - Color Monitor (national brand)	*\$239.00
<b>*PLUS \$9.95 for Connecting Cable.</b>	

### Display Monitors From Sanyo

With the need for computing power growing every day, Sanyo has stepped in to meet the demand with a whole new line of low cost, high quality data monitors. Designed for commercial and personal computer use. All models come with an array of features, including up-front brightness and contrast controls. The capacity 5 x 7 dot characters as the input is 24 lines of characters with up to 80 characters per line.

Equally important, all are built with Sanyo's commitment to technological excellence. In the world of Audio/Video, Sanyo is synonymous with reliability and performance. And Sanyo quality is reflected in our reputation. Unlike some suppliers, Sanyo designs, manufactures and tests virtually all the parts that go into our products, from cameras to stereos. That's an assurance not everybody can give you!



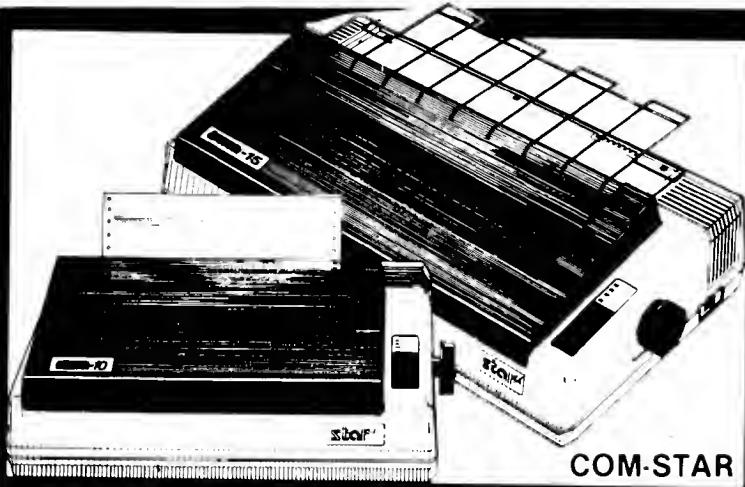
- LOWEST PRICES • 15 DAY FREE TRIAL • 90 DAY FREE REPLACEMENT WARRANTY
- BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add \$10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$20.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. Visa - MasterCard - C.O.D.

**PROTECTO ENTERPRISES** (WE LOVE OUR CUSTOMERS)  
BOX 550, BARRINGTON, ILLINOIS 60010  
Phone 312/382-5244 to order

# 80 COLUMN PRINTER SALE—\$149.00\*



## COM-STAR T/F

Tractor  
Friction  
Printer

only \$199\*\*

• 15 Day Free Trial - 180 Day Immediate Replacement Warranty

- Lowest Priced, Best Quality, Tractor-Friction Printers in the U.S.A.
- Fast 80-120-160 Characters Per Second • 40, 46, 66, 80, 96, 132 Characters Per Line Spacing
- Word Processing • Print Labels, Letters, Graphs and Tables • List Your Programs
- Print Out Data from Modem Services • "The Most important Accessory for Your Computer"

### \*STX-80 COLUMN PRINTER—\$149.00

Prints full 80 columns. Super silent operation, 60 CPS, prints Hi-resolution graphics and block graphics, expanded character set, exceptionally clear characters, fantastic print quality, uses inexpensive thermal paper! Best thermal printer in the U.S.A.! (Centronics Parallel Interface).

### \*\*DELUXE COMSTAR T/F

### 80 CPS PRINTER—\$199.00

The COMSTAR T/F (Tractor Friction) PRINTER is exceptionally versatile. It prints 8½" x 11" standard size single sheet stationary or continuous feed computer paper. Bi-directional, impact dot matrix, 80 CPS, 224 characters. (Centronics Parallel Interface).

### Premium Quality—120 CPS COMSTAR T/F SUPER-10X PRINTER—\$289.00

COMSTAR T/F (Tractor Friction) SUPER-10X PRINTER gives you all the features of the COMSTAR T/F PRINTER plus a 10" carriage, 120 CPS, 9 x 9 dot matrix with double strike capability for 18 x 18 dot matrix (near letter quality), high resolution bit image (120 x 144 dot matrix), underlining, back spacing, left and right margin settings, true lower decenders with super and subscripts, prints standard, italic, block graphics

and special characters, plus 2K of user definable characters! The COMSTAR T/F SUPER-10X PRINTER was Rated No. 1 by "Popular Science Magazine." It gives you print quality and features found on printers costing twice as much!! (Centronics Parallel Interface) (Better than Epson FX-80).

### Premium Quality—120 CPS COMSTAR T/F SUPER-15½" PRINTER—\$379.00

COMSTAR T/F SUPER 15½" PRINTER has all the features of the COMSTAR T/F SUPER-10X PRINTER plus a 15½" carriage and more powerful electronics components to handle large ledger business forms! (Better than Epson FX 100).

### Superior Quality SUPER HIGH SPEED—160 CPS COMSTAR T/F 10" PRINTER—\$489.00

SUPER HIGH SPEED COMSTAR T/F (Tractor Friction) PRINTER has all the features of the COMSTAR SUPER-10X PRINTER plus SUPER HIGH SPEED PRINTING—160 CPS, 100% duty cycle, 8K buffer, diverse character fonts, special symbols and true decenders, vertical and horizontal tabs. RED HOT BUSINESS PRINTER at an unbelievable low price!! (Serial or Centronics Parallel Interface)

### Superior Quality

### SUPER HIGH SPEED—160 CPS COMSTAR T/F 15½" PRINTER—\$579.00

SUPER HIGH SPEED COMSTAR T/F 15½" PRINTER has all the features of the SUPER HIGH SPEED COMSTAR T/F 10" PRINTER plus a 15½" carriage and more powerful electronics to handle larger ledger business forms! Exclusive bottom paper feed!!

### PARALLEL INTERFACES

For VIC-20 and COM-64—\$49.00

For All Apple Computers—\$79.00

NOTE: Other printer interfaces are available at computer stores!

### Double Immediate Replacement Warranty

We have doubled the normal 90 day warranty to 180 days. Therefore if your printer fails within "180 days" from the date of purchase you simply send your printer to us via United Parcel Service, prepaid. We will IMMEDIATELY send you a replacement printer at no charge, prepaid. This warranty, once again, proves that WE LOVE OUR CUSTOMERS!

## PROTECTO ENTERPRISES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010  
Phone 312/382-5244 to order

Add \$17.50 for shipping, handling and insurance. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. VISA — MASTER CARD ACCEPTED. We ship C.O.D.

SUPER-10"

ABCDEFGHIJKLMNOPQRSTUVWXYZ  
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890



## COMBINATION "DAISY WHEEL" PRINTER / TYPEWRITER

"WORLD'S FINEST"  
LIST \$799.00  
SALE \$489.00

- SUPERB COMPUTER PRINTER COMBINED WITH WORLD'S FINEST ELECTRONIC TYPEWRITER!
- BETTER THAN IBM SELECTRIC — USED BY WORLD'S LARGEST CORPORATIONS!
- TWO MACHINES IN ONE — JUST A FLICK OF THE SWITCH!
- SUPERB EXECUTIVE CORRESPONDENCE — HOME, OFFICE, WORD PROCESSING!
- EXTRA LARGE CARRIAGE — ALLOWS 14-1/8" PAPER USAGE!
- DROP IN CASSETTE RIBBON — EXPRESS LIFT OFF CORRECTION OR ERASER UP TO 46 CHARACTERS!
- PRECISION DAISY WHEEL PRINTING — MANY TYPE STYLES!
- PITCH SELECTOR — 10, 12, 15 CPS, AUTOMATIC RELOCATE KEY!
- AUTOMATIC MARGIN CONTROL AND SETTING! KEY IN BUFFER!
- ELECTRONIC RELIABILITY, BUILT IN DIAGNOSTIC TEST!
- CENTRONICS PARALLEL INTERFACE BUILT-IN (SERIAL OPTIONAL)!
- 15 DAY FREE TRIAL — 90 DAY FREE REPLACEMENT WARRANTY!

Add \$17.50 for shipping and handling!!

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. VISA — MASTER CARD ACCEPTED. We ship C.O.D.

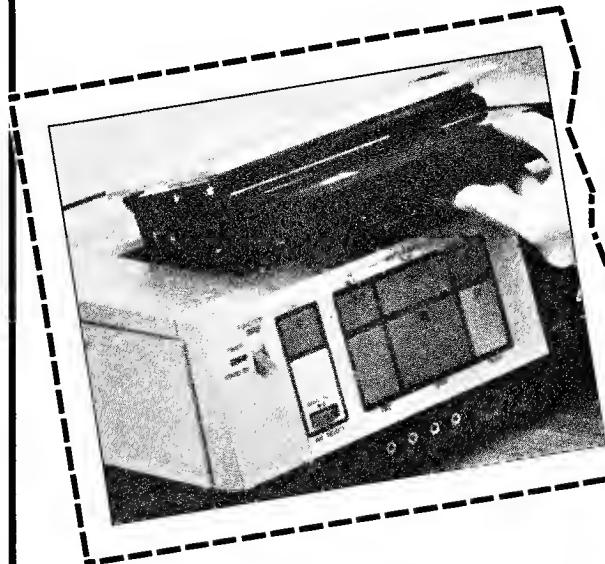
**PROTECTO  
ENTERPRISES** (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010  
Phone 312/382-5244 to order

# NOW SHOWING

## THE HOTTEST NEW VIDEO IN TOWN

**Introducing Hayden Book Company's latest innovation—videotapes. Relaxed. Friendly. And easy to follow. These 30-minute videotapes provide the user with the fastest, easiest approach to the setup, operation, even programming of an Apple computer.**



**HAYDEN**

**Order by Phone 1-800-631-0856**  
operator IN54 • In NJ call (201) 393-6315

### Problem Solving in BASIC with the Apple IIe™

(Belove-Laisserin) Don't frustrate yourself trying to understand technical instruction manuals. Sit back in your favorite easy chair. Turn on your set. Load the cassette. And let your VCR do the rest.

What you get is a visual tour of top-down programming on your Apple IIe—how you state a problem, how you break that problem into workable modules or subroutines, then how you actually write BASIC instructions for each step. **Available in both VHS (#6321) and BETA (#6322) formats. \$59.95 each.**

### Brush up on your BASICs with... Basic Apple™ BASIC

(Coan) The instant bestseller that spawned an entire series of machine-specific versions. Over 80 programs in all, even some that get you into using the screen editor, immediate mode execution, and the memory capacity for graphics. Perfect companion to the Apple videotape. **#5626 \$14.95**

Apple is a trademark of Apple Computer Company, which is not affiliated with Hayden Book Company. Prices subject to change.

**Mail to:** Dept. IN54 • Hayden Book Company  
10 Mulholland Drive • Hasbrouck Heights, N.J. 07604  
Please send me the book(s) indicated below by code number. If I am not completely satisfied I may return the book(s) undamaged, within 10 days for a complete refund. Residents of NJ and CA must add sales tax.  
I am enclosing \$2.00 to cover postage and handling.  
 Enclosed is my check or money order  
 Bill my  Visa  MasterCard

Name	<input type="text"/>
Address	<input type="text"/>
City	<input type="text"/>
State/Zip	<input type="text"/>
Visa/MasterCard #	<input type="text"/>
Signature	<input type="text"/>
Expires	<input type="text"/>

# The Applesoft Adviser

by Dan Bishop



## The Sort Index

Several readers have written me over the last few months to request a series of articles on data structures within Basic. Like many other fields of study, data structures can be dealt with in a highly abstract and theoretical form. The subject can also be approached from a practical applications point of view, and you can rest assured that that is how I intend to treat it in my articles.

### First, Some Hints

Before starting with this month's topic, the sort index, I would like to provide a solution to a problem that keeps coming up in my mail. I call it "The Case of the Elusive Syntax Error." There are two situations that bring this problem about. The first occurs when there is a syntax error in a user-defined function (a line that begins DEF FN ...), the second when there is a syntax error in a data statement.

In both cases a program will crash with the message SYNTAX ERROR IN LINE ####. The line number given in the error message is not, however, the line containing the syntax error. It is the line that contains the reference to the function or data statement. To find the real location of the syntax error, you need to go back in the program to the DEF FN instruction or the DATA line. For example, type in the following two-line program and attempt to run it:

```
10 DEF FNA(X) = X*(X - 1  
20 PRINT FNA(10)
```

You will receive a SYNTAX ERROR IN 20 message, even though there is

no problem with line 20 at all. The problem is in the line where the FNA function was first defined, line 10.

A similar problem crops up when you are using a system that requires adhering to specific syntax rules for data statements (not in Applesoft Basic). Some systems require that each comma in a list of data elements be followed by a space before the next data element is defined. If you leave the space out, you will get the elusive syntax error. For example:

```
10 DATA 18, 22, 33, 14, 8, 12  
20 FOR I=1 TO 6  
25 READ A  
30 NEXT I
```

will result in a SYNTAX ERROR IN 25 message. The error, of course, is really in line 10.

If you aren't aware of this feature, you can spend hours pulling your hair out and kicking the dog, trying to determine how a simple line like READ A can have a syntax error!

### Why a Sort Index

If you have a list of five or ten names, stored in RAM in an array, and you wish to keep these names in alphabetical order, it is a very simple task to re-order the list whenever you add another name so that the new one appears in its alphabetical correct position. However, most lists are not so simply handled. The lists themselves are usually much longer, involving hundreds or thousands of names. The records that need to be alphabetized are not all in a simple RAM array. They are usually individual records stored on disk. The time and loss of efficiency

that would result with every attempt to re-sort such a large disk file would seriously cut into the computer's usefulness. After all, what does it take to insert a new record into an alphabetically organized filing cabinet?

The solution to this dilemma lies in the sort index. When a file has a sort index, any new record to be added to the file is placed in the most convenient location. If there were a vacancy resulting from a deleted record, then that location would be a logical one for the new record. If the file had no such vacancies, then the new record would be appended to the end of the file. The actual order of appearance of records within the file is of no importance.

What is important is where this new record's location number, or record number (RN), appears in the sort index. The sort index, which is simply a one-dimensional array of integers, is kept in RAM and must be re-sorted every time a record is added or deleted from the file. This index keeps a list of record numbers such that their order within the list corresponds to the alphabetical order of the records themselves. Figure 1 illustrates how the elements in a sort index keep the file organized.

The records in a file can be scanned or searched alphabetically by using the elements within the sort index to specify the sequence in which records are to be accessed. Listing 1 provides a simple program to illus-

Write to Dan Bishop at Custom Comp, PO Box 429, Buena Vista, CO 81211.

JHELP  
?SUBSCRIBE TO  
**Cider**

J\*

Now you can get all the help you need to improve your Apple\* computing skills...in one place. **inCider** gives you more *practical* information on Apple products and programming than any other source. Every issue covers the field for you with these instructive columns:

- *The Applesoft Adviser* discloses the subtleties of programming in Applesoft Basic.
- *The Assembly Advantage* reveals the power of Assembly language programming.
- *Bent on Business* explains the best ways to increase office productivity with your Apple.
- *Fudge It!* shows you how to add eye-catching color, hi-res, and sprite graphics to your print-outs and games.
- *Interaction—A Child's World* gives you fun programs to introduce your children to computing.
- *III's Company* unlocks the hardware & software secrets of the Apple III.
- *Hints 'n' Techniques* offers affordable solutions to everyday computing problems.

That's not all. Every month over a dozen easy-to-understand articles bring you the latest hardware projects, utilities,

applications, games, and Pascal & Logo programs & tips. Now you can:

- make every purchase a sound investment with the candid buyer's guides and product reviews.
- use the colorful ads to comparison-shop from home.
- read about new products before they reach the stores.

With all this at your fingertips, you could save the cost of your subscription with one wise purchase.

And your subscription to **inCider** is risk-free. If you don't like your first issue,

just write "cancel" across the invoice and return it to us. You won't owe a thing.

Subscribe to **inCider** today. A full year is only \$24.97. Fill out the coupon below or the attached order card right now, and return it to: **inCider** Subscription Department, PO Box 911, Farmingdale NY 11737. For even faster service, call toll free:

**1 (800) 258-5473**

In New Hampshire call 1-924-9471. Get a 13th issue **FREE** when you enclose payment or charge it on your Mastercard, Visa, or American Express.

\*Apple is a registered trademark of Apple Computer Inc.

ENTER my subscription to **inCider** for one year at \$24.97. I understand that with payment enclosed or credit card order I will receive a **FREE** issue, making a total of 13 issues for \$24.97.\* This offer voids all previous offers.

Check enclosed    MC    VISA    AE    Bill me

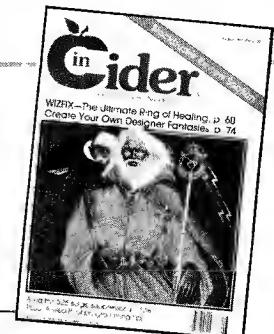
Card # \_\_\_\_\_ Exp. date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_



State \_\_\_\_\_ Zip \_\_\_\_\_

Canada and Mexico \$27.97, 1 year only, US funds drawn on US bank. Foreign surface \$44.97, 1 year only, US funds drawn on US bank. Please allow 6-8 weeks for delivery. Foreign airmail please inquire.

**inCider® • PO Box 911 • Farmingdale, NY 11737**

**345F5**

trate how this concept works. Although this listing and Listing 2 use read/data instructions to set up the records list into an array, the same principles apply to accessing records directly out of disk files. In these examples, the sort index contains the subscript reference to the record array. With disk files, the array elements in the sort index reference actual record numbers in a random access disk file.

With Listing 1, note that, although the data records in the array are listed in random order, when the sort index is used to access these records they are brought out in alphabetical order. The key to using the sort index lies in line 140. Note that if records are accessed by merely using the loop counter—thus A\$(I)—the records are printed in the order of their occurrence in the file (or array). On the other hand, if the subscript used is the value present in the sort index array, N(I), then the records, accessed by A\$(N(I)), are retrieved in alphabetical order. It does take some acclimating to be comfortable using a subscripted variable such as N(I) as a subscript itself!

## The Binary Search

Of course, in actual use a sort index must be set up to allow additions, deletions and re-ordering functions to take place. And in order to carry out those functions an efficient search routine must be available that can use the index elements and rapidly search through the file (or array). This search routine has to perform two functions. For the case where it is being used to locate a record already in the file, it must scan through the file to find the desired record. On the other hand, when a new record is to be added to the file, the search routine has to scan through the file to determine where the new record should be placed. That is, it must determine where the new record's actual location (record number) is to be placed in the sort index array.

The simplest way to handle such a search is to go through the file se-

```

10 REM LISTING 1 - USING A SORT INDEX
20 DATA "JOHN", "BARRY", "ZAK", "TOM", "MARY", "SUE", "HARRY", "BILL"
30 DATA 2, 8, 7, 1, 5, 6, 4, 3
39 REM READ NAMES INTO A$ ARRAY
40 FOR I=1 TO 8
50   READ A$(I)
60 NEXT I
69 REM READ INDEX INTO N ARRAY
70 FOR I=1 TO 8
80   READ N(I)
90 NEXT I
99 REM DISPLAY ARRAY AND SORTED LIST
100 HOME
110 PRINT "ORIGINAL LIST"; TAB(20); "SORTED LIST"
120 PRINT
130 FOR I=1 TO 8
140   PRINT A$(I); TAB(20); A$(N(I))
150 NEXT I
160 END

```

*Listing 1. Simple example of the use of a sort index.*

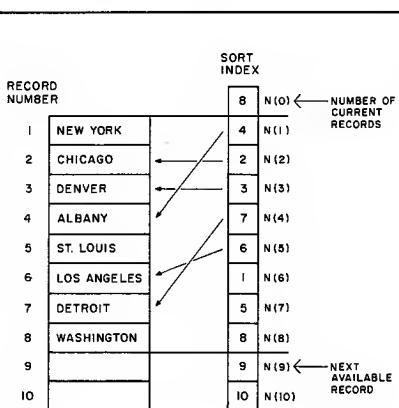
quentially, reading records in order until the correct record has been located. This method may work for small files, or even for files that are located completely in RAM as large data arrays. However, when the

an efficient way to locate a given record within the file. A single record in a file containing over 1000 records can be located with 11 or fewer accesses. The concept is simple. You first divide the file in half and pull out the central record in the ordered file. If the record you are searching for comes before this record (alphabetically) then you needn't waste time looking through the last half of the file. Reset the maximum to this central point, and find the record that lies halfway between the start of the file and the new maximum.

Suppose now that your record comes after the record just selected from the file. This means you can chuck the front fourth of the file, just as you previously discarded the back half of the file. With two comparisons, you have eliminated three fourths of the file. Continuing in this fashion allows you to narrow the field by half each time until the entire file has been scanned.

The binary search subroutine in Listing 2 begins at line 2500. This subroutine assumes that the data being scanned is stored in the A\$(i) array and that this array has a sort index N(i). The item you are searching for is defined as DD\$, and the size of the file is stored in N(0).

Within the routine, MN is the bottom index subscript and MX is the top index subscript for the portion of the file currently being scanned. Of course, at the start MN is set to 1 and MX is set to N(0). Lines 2510-2535 handle the special case where these two values differ by only one. On the other hand, lines 2550-2565 deal with the more common situation.



*Figure 1. The sort index, N(i), contains the record numbers for the sorted file, with these numbers listed in alphabetical sequence. The elements in the sort index are pointers to individual records in the sorted file.*

files are disk files, and only one record at a time can be transferred to RAM for scrutiny, this method becomes painfully slow.

Listing 2 illustrates a superior approach for any type of search through a file that is ordered alphabetically. Of course, in this case the ordering is done through the index rather than the file itself, but the computer doesn't know that.

A binary search through a file is

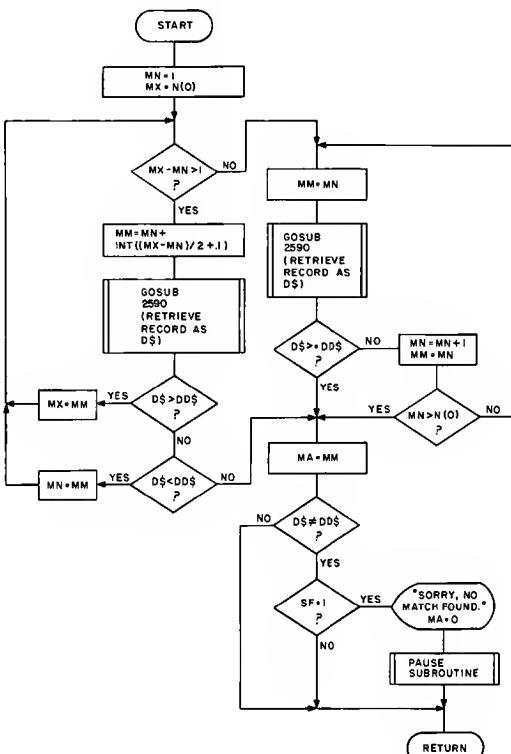


Figure 2. Flow chart for the binary search routine presented in Listing 2. DD\$ is the item being searched for in a file containing N(0) records. If a match is found, the subroutine returns MA, the index subscript for the desired record.

```

5 REM Listing 2 - USING A SDRT INDEX WITH A BINARY SEARCH
10 DATA JANE, MARY, SUE, ALICE, QUIN, AVDN, BARRY, SALLY, JUNE
20 DATA 9,4,6,7,1,9,2,5,8,3
30 FDR I=1 TO 9
35 READ A$(I)
40 NEXT I
45 FDR I=0 TD 9
50 READ N(I)
55 NEXT I
60 INPUT "ENTER NAME TO BE FOUND (OR <STDP>)...";DD$
65 IF DD$="STOP" THEN END
70 SF=1: GDSUB 2500: SF=0
75 IF MA=0 THEN 60
80 PRINT A$(N(MA));" IS RECORD # ";N(MA)
85 PRINT "AND IS ITEM # ";MA;" IN THE SORTED LIST."
90 PRINT
95 GDTD 60
999 REM PAUSE ROUTINE
1000 FDR I=1 TO 1000:NEXT I:RETURN
2499 REM BINARY SEARCH RDTUENT
2500 MN=1: MX=N(0)
2505 IF (MX-MN)>1 THEN 2550
2510 MM=MM
2515 GOSUB 2590
2520 IF D$>DD$ THEN 2570
2525 MN=MN+1: MM=MM
2530 IF MN>N(0) THEN 2570
2535 GOTD 2510
2550 MM=MM + INT((MX-MN)/2 + .1)
2555 GOSUB 2590
2560 IF D$=DD$ THEN MX=MM: GDTD 2505
2565 IF D$#DD$ THEN MN=MM: GOTO 2505
2570 MA=MM
2575 IF D$=DD$ THEN 2585
2580 IF SF=1 THEN PRINT "Sorry, no match found.": MA=0: GDSUB 1000
2585 RETURN
2590 RN=N(MM)
2595 D$=A$(RN): RETURN

```

Listing 2. The binary search routine, key to the use of the sort index.

The midpoint between MN and MX is determined (line 2550) as MM and record N(MM) is retrieved from the file as D\$.

If D\$ is greater than DD\$, then MX is reset to MM, discarding the top half of the file. If D\$ is less than DD\$, then MN is reset to MM, discarding the lower half of the file. When a match is found, MA is set to the sort index subscript that contains the desired record number. If no match is found after searching the entire file, a message to that effect is displayed.

There is one other function built into Listing 2. When a new record is added, the file must be searched in exactly the same manner. In this case the program is not expecting to find an exact match, but rather to determine the location for this new record. The procedure is the same, except that when the entire file has been searched to find the new record's location the subroutine does not display the NO MATCH FOUND message. Instead, the value of MA is returned to the main program. This value corresponds to the location for inserting the new record's record number into the sort index. A flag value, SF, is set prior to using the binary search subroutine. If SF has a value of 1, then the subroutine expects to find a match in a search; if SF has a value of 0, then the subroutine expects to locate the correct position for a new record. Figure 2 presents the flowchart for this subroutine.

In most applications, the records will not be stored in RAM as an array. The only change that needs to be made to this subroutine to handle disk files is line 2595. The record number is determined in line 2590, and this record number can then be used in a set of disk access instructions to pull out record RN, set D\$ equal to that part of the record being used for the comparison in the search, and then return. Everything else in the subroutine will function the same way.

## Setting Up the Index

In both of the previous examples

# Forbidden Fruit . . .

**Think about it . . .**

**"NO PROGRAM IS PERFECT FOR EVERYONE."**

All of them will soon need improvements,  
updates, additions and other modifications.

But Copy-Protection of a disk  
prevents you from making changes!

## **Copy-Protection is:**

**anti-back-up** (it does not let you back up the disk.)

**anti-listing** (it prevents you from viewing the listings.)

**anti-customizing** (you cannot alter it to fit your needs.)

in other words . . . it is: **ANTI-USER!**

HARDCORE

## **Computist:**

- opposes copy-protection as it is now used.
- will reveal how it is done and un-done.
- shows users how to back up such disks.

**Subscribe NOW to a users magazine.**

\*\$25 a year for 12 information packed issues.

Send me one year (12 issues) of HARDCORE Computist.  IC1  
U.S. \$25    APO/FPO (1st Class) \$34    Canada \$34    Mexico \$39    All Others \$60

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Country \_\_\_\_\_ Phone \_\_\_\_\_

VISA     MC    # \_\_\_\_\_ Exp Date \_\_\_\_\_

Signature \_\_\_\_\_

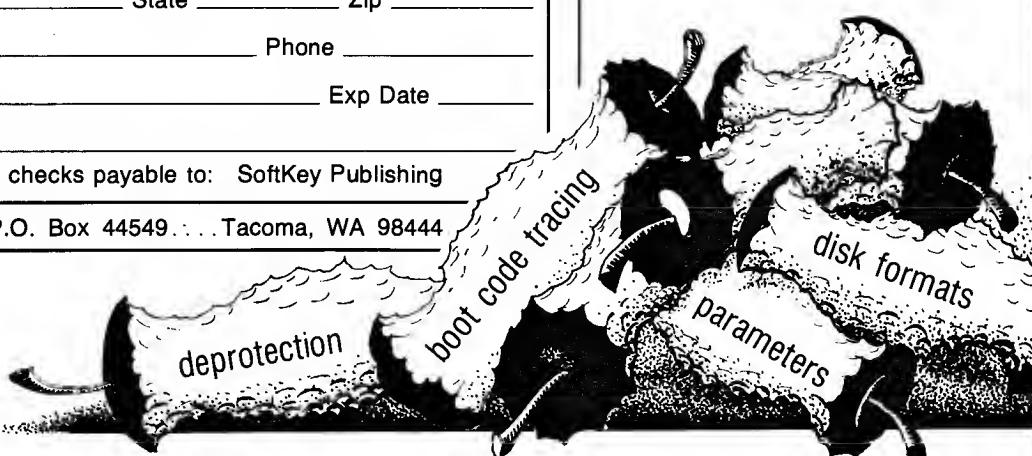
U.S. funds only. Make checks payable to: SoftKey Publishing

SoftKey Publishing . . . P.O. Box 44549 . . . Tacoma, WA 98444

Circle 427 on Reader Service card.



**NOT  
ANY  
MORE!**



# The Applesoft Adviser

the sort index was already established for the data set used. In a real application the index needs to start with no records and adjust itself as new records are added or deleted. This problem is not nearly as difficult as it looks. The key feature in performing these functions lies in the binary search routine described above.

When first setting up the sort index, you need to determine the maximum number of records to be kept in the alphabetized sort list. This is necessary in order to properly dimension the sort index, and also to set it up with initial values that will keep the index functional as new records are added and deleted.

The first entry into the index will correspond to the current number of active records included in the index. At the start, that value is 0 and is kept in N(0). All of the remaining elements in the index will contain a value that corresponds to the "next available record." You can then always look to index element N(0) + 1 to find a value that tells where the next available record in your file will be. This will correspond to the record number you assign to the next record added to the file.

For example, if you have added ten records to the file, with no records being deleted, then N(0) = 10 and elements 1-10 in your index file will contain the numbers 1-10 (but probably not in sequential order, unless you just happened to enter the ten records alphabetically). The next available record will be record 11. This number should be obtained by looking at the value of N(11). As you can tell from this, the first thing to do before using the index file is to assign every element a number that corresponds to the value of its own subscript. The subroutine at 2200 handles this:

```
10 DIM N(100)
2200 FOR I=0 TO N
2205   N(I)=I
2210 NEXT I
2215 RETURN
```

Now, whenever you have a new record to add, you need only check the value contained in N(N(0) + 1) to

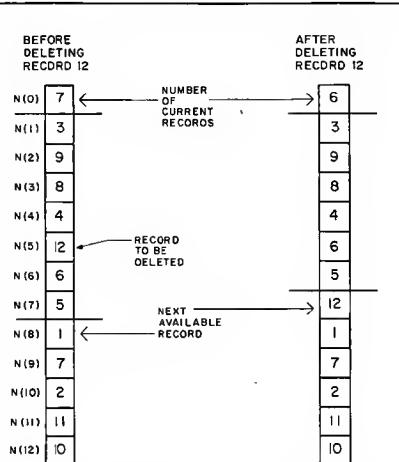


Figure 3. Comparison of the sort index before and after record number 12 is deleted. Note that the record number is not discarded. Rather, it is added to the top of the list. The next addition made to this file will use record number 12 for the actual location to store the new record.

find the appropriate next-available slot in the array or file to store the new record.

When you delete a record, you compress the "active part" of the index array and place the removed record's record number at the top of the active list. Thus you keep track of vacancies as they are produced in the file and can simply refer to the top of the active list to find where the next available record vacancy lies.

For example, suppose record 12 (sort index position 5) were removed from the file. Referring to Figure 3,

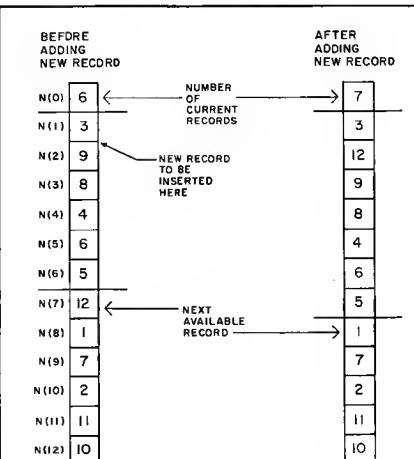


Figure 4. Comparison of the sort index before and after a new record is added to the file. The binary search routine determined that the new record should be the second item in the alphabetical list.

you will notice that, for this operation, MA = 5 and N(MA) = 12. The following sequence handles the deletion from the sort index:

```
2000 T=N(MA)
2005 FOR I=MA TO N(0)-1
2010   N(I)=N(I+1)
2015 NEXT I
2020 N(N(0))=T
2025 N(0)=N(0)-1
2030 RETURN
```

This short routine resets the entire index array from element MA to the top, squeezing out the old record number and replacing it at the top of the active list so it will be the first used when a new record is entered.

## Adding New Records

In a sense, adding records to the sort index is just the opposite of deleting them. You need to conduct a binary search (with SF=0) to find a value for MA that corresponds to the location your new record should occupy in the sort index. You also need to get this record's actual record number by checking the next available record from your sort index, element N(N(0) + 1). Place the record in the file or array, and use the following subroutine to merge the new record number into its appropriate position in the index:

```
2100 RN=N(N(0)+1)
2105 IF N(0)=0 THEN 2125
2110 FOR I=N(0) TO MA STEP -1
2115   N(I+1)=N(I)
2120 NEXT I
2125 N(MA)=RN
2130 N(0)=N(0)+1
2135 RETURN
```

Figure 4 illustrates this expansion of the sort index to accommodate the new record. Of course, the value for MA must be obtained from the binary search routine before this subroutine is called.

Listing 3 illustrates the full use of a sort index on the A\$(i) array. Again let me emphasize that the techniques presented here will work as easily on disk files as on a RAM array by merely changing the references to the A\$(i) array in the program to subroutines handling disk I/O procedures. When using disk files, the sort index must, of course,

# PROGRAMS Plus

429 Honeyspot Road • Stratford, Connecticut 06497

## Corporate and School Purchase Orders Accepted

Mon.-Fri. 9-6; Sat. 10-6

**ORDERS ONLY — TOLL FREE**

**1-800-832-3201**

Inquiries & Conn. residents call (203) 378-3662 or 378-8293

**30% to 50% off retail**

**APPLE //e COMPUTER . . . . . Call  
FRANKLIN COMPUTER . . . . . Call**

<b>Business</b>	<b>Our Price</b>	<b>Our Price</b>	
DB Master Version Four . . . . .	230.00	PFS: Write //e . . . . .	82.00
DB Master Utility Pak #1 . . . . .	86.00	PFS: File . . . . .	82.00
DB Master Utility Pak #2 . . . . .	86.00	PFS: Report . . . . .	82.00
D Base II . . . . .	415.00	PFS: Graph . . . . .	82.00
Data Perfect . . . . .	99.00	The Incredible Jack . . . . .	115.00
The General Manager II . . . . .	150.00	Magic Calc . . . . .	95.00
The List Handler . . . . .	39.00	Multiplan . . . . .	175.00
Data Fax 80 Column . . . . .	179.00	The Dictionary . . . . .	65.00
Datalink . . . . .	70.00	The Sensible Speller . . . . .	82.00
Data Factory 5.0 . . . . .	216.00	Dow Jones Market Analyzer . . . . .	275.00
Word Juggler //e . . . . .	185.00	Real Estate Analyzer II . . . . .	120.00
Lexicheck . . . . .	105.00	F.C.M. . . . .	65.00
Pie Writer V 2.2 . . . . .	105.00	Wordstar . . . . .	249.00
Screenwriter II . . . . .	82.00	Infostar . . . . .	249.00
Supertext Professional . . . . .	70.00	Reportstar . . . . .	221.00
Format II Enhanced . . . . .	105.00	Bookends . . . . .	79.00
Letter Perfect . . . . .	112.00	Apple Writer //e . . . . .	165.00
Word Handler II . . . . .	42.00	TK Solver . . . . .	210.00
Magic Window II . . . . .	95.00	BPI General Accounting . . . . .	275.00

<b>Home</b>	<b>Our Price</b>	<b>Our Price</b>	
Home Accountant . . . . .	48.00	Master Type . . . . .	27.00
ASCI: Express Professional . . . . .	85.00	Know Your Apple //e . . . . .	18.00
Data Capture //e . . . . .	67.00	Dollars and Sense . . . . .	72.00
Bank Street Writer . . . . .	48.00	The Personal Accountant . . . . .	95.00
Homework . . . . .	37.00	Time Is Money . . . . .	65.00
SAT English I . . . . .	21.00	Money Street . . . . .	72.00
Typing Tutor II . . . . .	18.00	Micro Cookbook II or //e . . . . .	27.50

## Hardware

<b>Printers</b>	<b>Call</b>	<b>PROWRITER (C. Itoh)</b>	
OKI DATA		8510AP Parallel . . . . .	399.00
Microline 82A FT . . . . .	439.00	1550AP Parallel . . . . .	679.00
Microline 83A FT . . . . .	689.00	<b>MONITORS</b>	
Microline 92 . . . . .	499.00	Amdtek Color I Plus . . . . .	310.00
Microline 93 . . . . .	799.00	Amdtek Color II Plus . . . . .	440.00
<b>BROTHER</b>		Amdtek Color III . . . . .	365.00
HR-1 . . . . .	Call	DVM II RGB Interface . . . . .	139.00
<b>NEC</b>		DVM 80e RGB Interface . . . . .	149.00
8023A w/Graphics Par. . . . .	475.00	Amdtek 300G Green . . . . .	149.00
<b>STAR MICRONICS</b>		Amdtek 300A Amber . . . . .	165.00
Gemini 10X . . . . .	310.00	Taxan 210 Color . . . . .	299.00
Gemini 15X . . . . .	455.00	Taxan RGB Vision 3 . . . . .	500.00
Delta 10 . . . . .	520.00	Taxan RGB-2 Interface . . . . .	140.00
<b>SMITH CORONA</b>		NEC 12 in. Color . . . . .	325.00
TP-1 . . . . .	499.00	USI 12 in. Amber . . . . .	159.00
<b>EPSON</b>		USI 12 in. Green . . . . .	147.00
FX-80 . . . . .	550.00	<b>DISK DRIVES</b>	
FX-100 . . . . .	699.00	Micro SCI A2 . . . . .	250.00
		Micro SCI A2 w/Controller . . . . .	325.00
		Rana Elite 1 add on . . . . .	275.00
		Rana Elite 1 w/Controller . . . . .	360.00
		Apple Disk II Drive . . . . .	345.00

For fast delivery send cashier's check, certified check or money order. Personal and company checks allow 3 weeks to clear. Shipping - Software (\$2.50 min.) C.O.D. add an additional \$1.75. Shipping - Hardware (please call). Alaska, Hawaii, Canada, PO, APO and FPO \$5.00 min. Foreign orders - \$15.00 min. and 15% of all orders over \$100. Mastercard & Visa (include card # and expiration date). Connecticut residents add 7.5% sales tax. We ship same day for most orders. Prices subject to change without notice. All returns must have a return authorization number. Call 203-378-3662 to obtain one before returning goods for replacement.

## Games

### Our Price

Lode Runner . . . . .	24.00
Exodus: Ultima III . . . . .	41.00
Minit Man . . . . .	13.50
Sargon III . . . . .	37.00
Airsim-3 . . . . .	34.00
Flight Simulator II . . . . .	39.00
The Quest . . . . .	13.50
Masquerade . . . . .	26.00
Starcross . . . . .	27.00
Cubit . . . . .	28.00
Suspended . . . . .	34.00
Zaxxon . . . . .	27.00
Odesta Chess 7.0 . . . . .	52.00
Caverns of Callisto . . . . .	26.00
Wizardry . . . . .	35.00
Knight of Diamonds . . . . .	24.00
Legacy of Lylgamy . . . . .	29.00
Microbe . . . . .	30.00
Zork I, II, or III . . . . .	27.00
Witness . . . . .	34.00
Deadline . . . . .	34.00
Time Zone . . . . .	65.00
Cosmic Balance II . . . . .	29.00
Galactic Adventures . . . . .	41.00
Bomb Alley . . . . .	41.00
Geopolitique 1990 . . . . .	29.00
Epidemic! . . . . .	29.00
North Atlantic '86 . . . . .	43.00
Germany 1985 . . . . .	41.00
Broadside . . . . .	29.00
The Dark Crystal . . . . .	27.00
Caverns of Freitag . . . . .	20.00
The Enchanter . . . . .	37.00
Quest for Tires . . . . .	26.00
Castle Wolfenstein . . . . .	20.00
Beneath Apple Manor Spec. Ed. . . . .	20.00
Choplifter! . . . . .	24.00
Stellar 7 . . . . .	24.00
Frogger . . . . .	24.00
The Mask of the Sun . . . . .	27.00
Spare Change . . . . .	23.00
Miner 2049er . . . . .	30.00
Planetfall . . . . .	34.00
Pinball Construction Set . . . . .	22.00
Chivalry . . . . .	28.00
The Coveted Mirror . . . . .	13.50
Eagles . . . . .	29.00
Pinball Construction Set . . . . .	28.00
Maze Craze Construction Set . . . . .	30.00
Beagle Bag . . . . .	20.00
Advanced Blackjack . . . . .	37.00
Ringside Seat . . . . .	30.00
Night Mission Pinball . . . . .	25.00
Donkey Kong (Atarisoft) . . . . .	27.00

## Hobby

### Our Price

Disk Quick . . . . .	21.50
Dos Boss . . . . .	16.50
Beagle Basic . . . . .	23.95
Beagle G.P.L.E . . . . .	36.95
Pronto Dos . . . . .	20.25
Utility City . . . . .	20.25
Double Take . . . . .	23.95
Apple Mechanic . . . . .	20.25
Typefaces . . . . .	14.50
Alpha Plot . . . . .	27.25
Zoom Graphics . . . . .	35.95
Bag of Tricks . . . . .	29.95
Applesoft Compiler (TASC) . . . . .	124.95
Compiler Plus . . . . .	71.95
Merlin Assembler . . . . .	46.95
Merlin Compo Pack . . . . .	80.45
Drca/M . . . . .	71.95
Lisa 2.6 . . . . .	56.95
The Visible Computer: 6502 . . . . .	34.95
The Graphics Magician . . . . .	40.95
The Graphics Department . . . . .	88.95

## Back Up Your Software

### Our Price

E.D.D. (Best Nibble Copier!) . . . . .	68.00
CIA Files (Best Disk Utilities!) . . . . .	55.00
Nibbles Away II . . . . .	54.00
Copy II Plus . . . . .	28.00
Locksmith 5.0 . . . . .	73.00
Back-It-Up III . . . . .	56.00
Wildcards . . . . .	Call
Replay II (II+ or //e) . . . . .	Call
Trak Star . . . . .	95.00

## Educational Software

### Our Price

Snooper Troops 1 or 2 . . . . .	31.00
Kids on Keys . . . . .	20.00
In Search of . . . . .	27.00
Hey Diddle Diddle . . . . .	20.00
Facemaker . . . . .	23.00
Delta Drawing . . . . .	41.00
Rhymes and Riddles . . . . .	20.00
Alphabet Zoo . . . . .	20.00
Story Machine . . . . .	24.00
Kindercomp . . . . .	20.00
Stickybear ABC . . . . .	29.00
Stickybear Numbers . . . . .	29.00
Stickybear Opposites . . . . .	29.00
Stickybear Shapes . . . . .	29.00
Rocky's Boots . . . . .	37.00
Gertrude's Secrets . . . . .	33.00
Gertrude's Puzzles . . . . .	33.00
Bumble Plot . . . . .	29.00
Bumble Games . . . . .	29.00
Juggie's Rainbow . . . . .	22.00
Plato Whole Numbers . . . . .	39.00
Plato Decimals . . . . .	39.00
Plato Fractions . . . . .	39.00
Word Attack/Davidson . . . . .	37.00
Math Blaster/Davidson . . . . .	37.00
Speedreader II/Davidson . . . . .	52.00
Alien Counter & Face Flash . . . . .	24.00
Gulp & Arrow Graphics . . . . .	24.00
Frenzy & Flip Flop . . . . .	24.00
Compu-Read . . . . .	20.00
Compu-Math . . . . .	34.00
Spelling Bee w/Reading Primer . . . . .	27.00
Algebra 1, 2, 3, or 4 . . . . .	27.00
SAT Word Attack Skills . . . . .	34.00
PSAT Word Attack Skills . . . . .	34.00
Decimals . . . . .	34.00
Fractions . . . . .	34.00
Hands-On Basic Programming . . . . .	59.00
Spelling Bee Games . . . . .	22.00
Counting Bee . . . . .	20.00
Moptown Hotel . . . . .	29.00
Moptown Parade . . . . .	29.00
Magic Spells . . . . .	26.00
Harcourt Brace Computer SAT . . . . .	49.00
New Step by Step/PDI . . . . .	59.00
Story Builder & Word Mstr/PDI . . . . .	17.00
Einstein Memory Trainer . . . . .	64.00
French Hangman/George Earl . . . . .	22.00
Latin Hangman/George Earl . . . . .	22.00
Spanish Hangman/George Earl . . . . .	22.00
Early Games (All programs) . . . . .	20.00
Math Maze . . . . .	27.00
Apple Logo . . . . .	165.00
Terapin Logo . . . . .	105.00
Songwriter . . . . .	29.00
Picture Writer . . . . .	29.00

## Accessories

### Our Price

System Saver . . . . .	69.00
Cool + Time . . . . .	75.00
Hayes Micromodem Smartcom I . . . . .	245.00
Microsoft Z-80 Softcard . . . . .	238.00
Microsoft 16K Ramcard . . . . .	75.00
Saturn 128K Ramcard . . . . .	375.00
Ultraterm . . . . .	295.00
Videoterm w/Soft Switch & Inv . . . . .	238.00
Accelerator II . . . . .	475.00
Corvis Hard Disks . . . . .	Call
Mockingboard . . . . .	Call
TG Paddles . . . . .	29.00
TG Joystick . . . . .	41.00
TG Select-A-Port . . . . .	41.00
Kraft Joystick . . . . .	44.00
Grappler Plus . . . . .	125.00
Buffered Grappler Plus . . . . .	180.00
Chalkboard Power Pad . . . . .	80.00
Chalkboard Starter Kit . . . . .	36.00
Koala Pad . . . . .	89.00
EPS Keyboard . . . . .	279.00
Elephant Trunk . . . . .	20.00
Perfect Data Cleaning Kit . . . . .	11.00
Novation Apple Cat II . . . . .	259.00

## Blank Media

### Our Price

Elephant SS/SD (10) . . . . .	20.00
Verbatim SS/DD (10) . . . . .	27.00
Maxell SS/DD (10) . . . . .	27.00
BASF SS/DD (10) . . . . .	24.00
Memorex SS/DD (10) . . . . .	25.00

For items not listed just call. If we don't have it, we can get it.

Visit Our Showroom: Exit 31 off I-95

```
5 REM FULLY IMPLEMENTED SDRT INDEX
10 DIM N(100), A$(100)
15 GDSUB 2200
20 HOME
25 PRINT "ENTER SELECTION:"
30 PRINT TAB(7) "A. ADD NEW ITEM."
35 PRINT TAB(7) "D. DELETE AN ITEM."
40 PRINT TAB(7) "S. SEARCH FOR AN ITEM."
45 PRINT TAB(7) "V. VIEW ARRAY AND INDEX."
50 PRINT TAB(7) "E. END THE PROGRAM."
55 PRINT: INPUT "CHDICE..."; C$
60 IF C$="A" THEN GDSUB 100
65 IF C$="D" THEN GDSUB 300
70 IF C$="S" THEN GDSUB 600
75 IF C$="V" THEN GDSUB 800
80 IF C$="E" THEN END
85 GDTD 20
99 REM NEW ITEM ENTRY RDTUINE
100 HOME
105 IF N(0)=99 THEN PRINT "ARRAY IS FULL.": GOSUB 1000: RETURN
110 INPUT "ENTER NEW ITEM..."; DD$
115 IF N(0)=0 THEN MA=1: GDTD 125
120 SF=0: GDSUB 2500
125 GDSUB 2100
130 A$(RN)=DD$
135 RETURN
299 REM ITEM DELETION RDTUINE
300 HOME
305 INPUT "ENTER ITEM TD DELETE..."; DD$
310 SF=1: GDSUB 2500: SF=0
315 IF MA=0 THEN RETURN
320 GDSUB 2000
325 PRINT "ITEM " DD$ " HAS BEEN DELETED."
330 GDSUB 1000
335 RETURN
599 REM SEARCH RDTUINE TO FIND SPECIFIED RECORD
600 HOME
605 INPUT "ENTER ITEM FDR SEARCH..."; DD$
610 SF=1: GDSUB 2500: SF=0
615 IF MA=0 THEN RETURN
620 PRINT "ITEM " DD$ " IS RECDRD # " N(MA)
625 PRINT " AND ITEM # " MA " IN THE SDRTED LIST."
630 GDSUB 1000
635 RETURN
799 REM RDTUINE TD DISPLAY RECDRD ARRAY, SDRT ARRAY, & SDRTED LIST
800 HOME
805 FDR I=1 TD N(0)
810 PRINT A$(I), N(I), A$(N(I))
815 NEXT I
820 PRINT .N(N(0)+1) " ----- NEXT AVAILABLE RECDRD"
825 FOR I=N(0)+2 TD N(0)+5
830 PRINT A$(I), N(I), A$(N(I))
835 NEXT I
840 INPUT "PRESS RETURN TO CONTINUE..."; X$
845 RETURN
999 REM PAUSE RDTUINE
1000 FDR I=1 TD 1000: NEXT I: RETURN
1999 REM DELETE ITEM FROM SDRT INDEX
2000 T=N(MA)
2005 FDR I=MA TO N(0)-1
2010 N(I) = N(I+1)
2015 NEXT I
2020 N(N(0)) = T
2025 N(0) = N(0) - 1
2030 RETURN
2099 REM ADD ITEM INTO SORT INDEX
2100 RN = N(N(0)+1)
2105 IF N(0)=0 THEN 2125
2110 FDR I=N(0) TO MA STEP -1
2115 N(I+1)=N(I)
2120 NEXT I
2125 N(MA) = RN
2130 N(0)=N(0)+1
2135 RETURN
2199 REM INITIALIZE SDRT INDEX VALUES
2200 FDR I=0 TD 100
2205 N(I)=I
2210 NEXT I
2215 RETURN
2499 REM BINARY SEARCH ROUTINE
2500 MN=1: MX=N(0)
2505 IF (MX-MN)>1 THEN 2550
2510 MM=MN
2515 GDSUB 2590
2520 IF D$=DD$ THEN 2570
2525 MN=MN+1: MM=MM
2530 IF MN>N(0) THEN 2570
2535 GOTO 2510
2550 MM=MN + INT((MX-MN)/2 + .1)
2555 GDSUB 2590
2560 IF D$=DD$ THEN MX=MM: GDTD 2505
2565 IF D$<DD$ THEN MN=MM: GDTD 2505
2570 MA=MM
2575 IF D$=DD$ THEN 2585
2580 IF SF=1 THEN PRINT "Sorry, no match found.": MA=0: GDSUB 1000
2585 RETURN
2590 RN=N(MM)
2595 D$=A$(RN): RETURN
```

*Listing 3. Fully implemented sort index, containing routines to add new records, delete old records, and search file for given records.*

also be stored on disk. It should be loaded into RAM at the beginning of the program so that it is always available for any functions relating to the disk file.

Be sure that you also save the sort index back onto disk before ending the program. In fact, I have found several situations in which I had to save the updated index onto disk after each revision during the operation of the program. This came up in operating environments where power fluctuations made it impossible to run the system all day without problems. By saving the sort index to disk after each update, I was assured that, should the system go down, all I needed to do was restart the system

**"Of course, any given file can have several sort index arrays attached to it, with each index maintaining a sort on a different field within the record."**

and all files and sort index arrays would be up-to-date.

## Conclusion

Of course, any given file can have several sort index arrays attached to it, with each index maintaining a sort on a different field within the record. Common business applications will have a sort index on client names and a second on account numbers. Large mailing lists may also have a sort index on zip codes, enabling the shipping department to do a pre-sort on bulk mailings.

Whatever your applications, you will probably find yourself at some time needing to keep a sort index on a favorite data file. The techniques described in this article will prove to be helpful in accomplishing that task. ■

# NEW SOFTWARE

## Amazing SuperSprite™ now has software galore!

Eight exciting new software programs for SuperSprite! Colorful and animated graphics. Dramatic sound effects. Actual speech. The peripheral card that revolutionized Apple® graphics now has software for learning, for playing, for fun with programming.

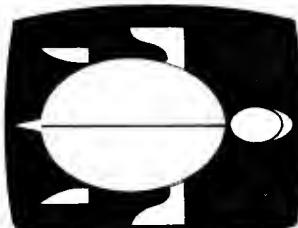


"One of this year's most important products for the Apple."

*Creative Computing*  
February, 1984

"This peripheral has completely changed the Apple...to an incredible machine with unlimited graphics (and sound) potential."

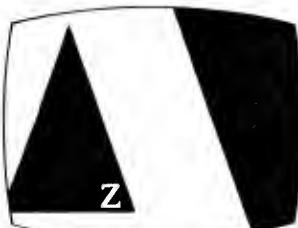
*InCider*  
September, 1983



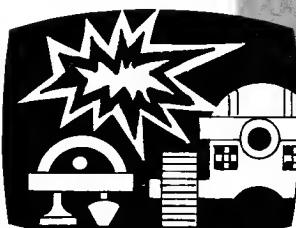
**LOGOSprite.** Sprites and sound join Terrapin LOGO for more learning fun.



**NumberSprites.** Colorful sprites and speech teach numbers and quantities.



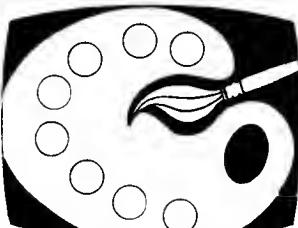
**AlphaSprites.** Children learn the alphabet with the aid of sprite animation and speech.



**KOBOR.** A fast-action maze game against deadly androids with dramatic sound effects and speech.



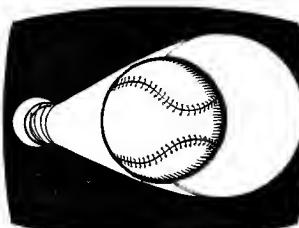
**Assembly Line Madness.** A race against a fast moving car assembly line to get the proper parts in place.



**SpriteArt.** Paintbrushes and a palette of colors to create sprites and scenery and animate the whole picture!



**MusicSprites.** Lively sprites add to the fun for visually creating colorful music.



**BaseballSprites.** Hear the roar of the crowd. The call of the umpire. Play baseball inside famous stadiums for real life thrills.

**Synetix Inc.**  
10635 N.E. 38th Place  
Kirkland, WA 98033

**800-426-7412**

**In Canada:** Exclusively by Chevco  
Computing, Mississauga, Ontario  
(416) 821-7600

Each program \$39.95. Software requires 48k Apple II series and SuperSprite.  
NumberSprites, AlphaSprites and Assembly Line Madness are registered trademarks of Avante Garde Creations, Inc. SuperSprite, LOGOSprite, KOBOR, SpriteArt, MusicSprites, BaseballSprites are registered trademarks of Synetix, Inc. Apple is a registered trademark of Apple Computers, Inc.



## Bent on Business

by Gregory R. Glau

# Talking to Yourself

For some time now there's been a lot of interest in the Lisa approach to computing, called *integrated software*. You enter your information only once, yet you can access and use the same data with software other than the program that created your files. Packages like Lotus 1-2-3 will soon be available for the Macintosh, but what about those of us who have an Apple II, II Plus or IIe?

I recently read a book which said that I already own something close to an integrated system (and you probably do, too), and while it can't do everything, it's near enough to the integrated approach to make it well worth while to learn how to operate it. In many cases it lets me talk to myself by allowing me to transfer information from one program to another.

The process is called the Data Interchange Format (DIF), and it's in the back of your VisiCalc manual (and many others)—you know, the part you skimmed through long ago, when you first read it. The whole idea is to save your information in a manner that allows other programs to read and use the data. In most cases, it's surprisingly automatic and well documented—the software often takes you step-by-step through the process.

### Why Bother?

One of the reasons that I never paid too much attention to the DIF file is that I couldn't find any use for it. Why go to the trouble of saving information from VisiCalc work-

sheets in a format other than the standard one that VisiCalc understands? My first experience with the concept came when I bought VisiTrend/Plot, an excellent graphics package. I'd saved and worked with all sorts of things inside VisiCalc that I found helpful to graph, but I didn't like the time it took (and errors I created in the data) to print the VisiCalc worksheets and then manually enter the information into VisiTrend/Plot. The solution, of course, was to save the data in a DIF file, and transfer it to the plotting program.

My purpose here is not to promote VisiCalc but to tell you a bit about and encourage the use of the DIF file as a way to get more mileage from the programs you already have. If you don't use VisiCalc as a spreadsheet, MagiCalc is another spreadsheet with DIF capabilities. Other graphics packages (in addition to VisiPlot) with this ability include PFS: Graph, Apple Business Graphics, VersaPlot, and the Prime Plotter. A database program called Information Master uses a system called Transit to convert VisiCalc files into those Information Master can read. Likewise, Accounting Plus II, an excellent package, uses Data Plus to convert its files into the Data Interchange Format. A terrific version of this system called AccountingPlus Super/e is available for the Apple IIe. DB Master, a powerful database system, has a utility package to let its files "speak DIF." The Executive Secretary, a word processing program that does a lot more

than what you'd expect an executive secretary to do, uses the format. All the "Visi—" series of programs from VisiCorp can use the DIF file, including VisiFile (file management), VisiTrend (a statistical adjunct to VisiPlot) and VisiTerm (which lets you share information with other computers). Statistics with DAISY (as you'd expect from the name, a statistical program) works with DIF files. Other programs are available.

Since the DIF file is essentially a text file, most word processors (and even Basic programs) can access its information. That data may not be in the final form you want it to have, but your word processing system gives you the power to put it into the format you need. If you've created an extensive numerical file with your spreadsheet that you'd like in a report or to put into a quotation for a major project, you don't have to retype all the information. Instead, save that section of your worksheet as a DIF file and load it into your word processing text.

### The Book

The definitive book on this subject is *The DIF file*, by Donald H. Beil (Reston Publishing, 11480 Sunset Hills Road, Reston, VA 22090). It includes numerous examples of exactly how to make the file transfer, using a good number of the programs noted above, as well as a Basic program listing for making and sav-

Address correspondence to Gregory R. Glau, PO Box 1627, Prescott, AZ 86302.

ing data into a DIF file, and another listing for reading your information once you save data there.

### Applications

Once you consider what you might do if your Apple II could use fully integrated software, you'll come up with all sorts of things it'd be helpful for your business to put into effect. While the DIF file doesn't truly integrate programs (there's some disk swapping involved, not every Apple program has the capability, and not every system that can use the DIF file can talk to every other program), it's the next best thing.

You might store, for example, your customer sales and warranty information on disk. Perhaps it would be helpful to examine those records and graph your warranty repair costs for each brand of equipment you sell. A DIF interface between your file handling and graphics package will do this for you.

You may want to pull out specific customer names and addresses from your database program and send a sales letter to certain people. A DIF file that lets your word processor work with the files in your database would make it possible.

Perhaps you've been graphing the raw data for your electricity costs, so you have its information stored in your plotting program files. Would it be useful to transfer this data to a spreadsheet system to calculate percentages and other information, and then send it back to the graphics package to see what the data looks like in another form? The DIF file lets you, and some programs can send information both ways—from the plotting program to the spreadsheet system to manipulate it, and then back to the graphics system to store.

The obvious benefit here is that you get to use all the power of both programs. For example, your graphics system probably doesn't contain all the mathematical functions that your spreadsheet can handle, so it's worth while to send data from the plotting system to manipulate on a

**"The obvious benefit here is that you get to use all the power of both programs."**

worksheet. Your spreadsheet may not provide the statistical capabilities that your graphics system has, so it's beneficial to let the latter act on your data to compute things like trend lines.

If you keep your customer accounts in an accounting package that can use DIF files, you can create an interface between it and your word processor to write letters to those people whose accounts are past due.

One of the best uses I've found for VisiCalc is to create a worksheet that details the costs involved when I bid a job, not just for my own internal use, but also (on a retail basis) to give to a prospect. Instead of trying to explain why an air conditioning system costs \$3,250, this breakdown does it for me. My prospect can see that the equipment costs \$1,450, freight \$45, ductwork material \$350, insulation \$275, and so on. Like anything else from a sales standpoint, it's helpful when you break things down into smaller quantities (and prices), as then the information is easier for people to relate to. Instead of concentrating on the big price, they look at each individual amount.

If you use this technique, you may have information stored in various VisiCalc worksheets that you'd like to get together and combine into one. A problem with VisiCalc in its standard form is that you must load or save an entire worksheet. The DIF file works in just the opposite manner; you notify the system of the specific section of the worksheet that you wish to save, and the DIF file saves just it. While I don't want to give away all the secrets of Don Beil's book, one of his best ideas is to show how you can save selected parts of your worksheets as DIF files, and then combine them into a design that's in the final form you need. While some other spreadsheets have this capability, the DIF file gives it to that old VisiCalc pro-

gram you may not have been getting the full use out of.

### Limitations

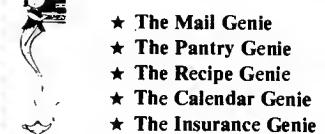
This method of transferring data has limitations, as it's primarily designed for working with numerical information. For example, in *The DIF File*, when author Beil sends text from DB Master to the Executive Secretary, he does so by using designated *numeric* fields. While your word processor will function in uppercase and lowercase, most database and spreadsheet programs don't, so if you do transfer text, you'll have to adjust your word processing program for this limitation.

More often than not, you must edit your data either before or after you send it along to another program. Not all information can be moved from one system to another. For example, the formulas you create on a VisiCalc worksheet won't transfer; their resulting data will (which is the important thing, after all).

All this shouldn't discourage you from trying the Data Interchange Format with the programs you now own. Experiment a little with some practice data and see how you do. I think you'll find the concept terrific, the implementation mostly a matter of following directions, and the results more than satisfactory. ■

Circle 103 on Reader Service card.

### The House-Ware Genies



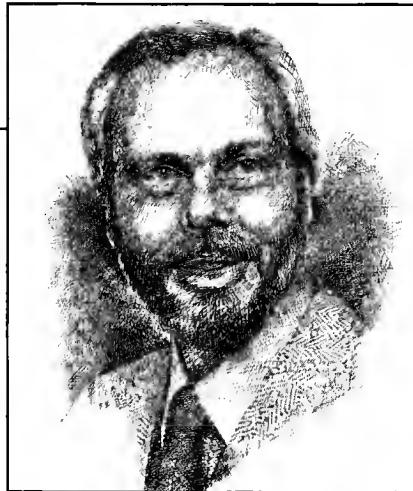
- ★ The Mail Genie
- ★ The Pantry Genie
- ★ The Recipe Genie
- ★ The Calendar Genie
- ★ The Insurance Genie

At last, the Turn-Key Programs that allow Dad to influence Mom that an Apple™ Computer is a modern day necessity.

Introductory Price **\$29.95 each**

Developed By  
**SOUTHERN CENTER FOR RESEARCH & INNOVATION**  
P.O. Box 1713  
Hattiesburg, MS 39403  
TELEPHONE 601-545-1680  
TELEX 585400 SCR1 US HATI  
CABLE SCR1 US

*Dealer Inquiries Invited*



## The Apple Clinic

by Earle Hancock

- Third-World Computing
- Sticky Keys
- The Vacuum Secret

I have a comment about the letter in your December column about using an Apple II Plus with 220 volt, 50 hertz current. Your recommendation that this not be done corresponds to what I have read elsewhere, but not to my own experience. There are at least 30 Apple users here in Nairobi with computers rated for 115v, 60hz, and none of us has ever had a problem which could be traced to the current (240v, 50hz in Kenya).

The key seems to be in obtaining a heavy-duty, double wound transformer with adequate capacity for one's entire system. The light, travel models do not work, but the big ones do. Since the Apple uses DC internally, the difference in cycles is not significant, and none of my other equipment (monitors, Epson printer, floppy drives, RAMdisk, various peripheral cards) is bothered. Note, however, that both of my monitors were purchased in the States and are designed to work with a 60 cycle system. As you note, a European model monitor will not work with a 60hz American Apple running off of a transformer.

So my advice to world travellers is to get a good, heavy-duty transformer and take your Apple system along. (In most of the Third World, a backup power supply and a good power filter are a good idea, too.) You'll be glad you did, and you may be surprised to find other Apple users at the destination.

I have a question about an intermittent problem with one of my Apple Disk II drives. Power may not be a concern here, but, like the reader who recently wrote to you from Lima, service is. It is expensive and

unreliable. Any repairs that I can carry out myself, therefore, are very helpful. Even if I can't fix something myself, it is important to know exactly what is wrong when I get someone else to try.

The problem is that drive 2 occasionally gives me I/O errors. This generally happens after the drive has been used heavily, and is preceded by a clicking noise similar to the one made when the drive calibrates itself to track 0, but somewhat muffled. The series of clicks repeats itself about three times, as if the drive is trying unsuccessfully to find track 0, and then I get an error message. If I leave the drive alone for a day or two, it seems to recover for a while.

I have adjusted the speed of the drive carefully, and also adjusted the 0 track stopper as per your suggestions in last November's column, but neither step solved the problem. I have even switched the analog board from the bad drive to the good one, but the problem stayed in drive 2. I wonder if the problem might have something to do with the disk alignment. Is there any way the disk can be aligned without going to an Apple dealer? If it's not the alignment, can you think of any other possible reason?

P.R. Christensen  
Kenya Institute of Education  
Nairobi, Kenya

The procedures you followed for narrowing down the reasons for the failure are just what I would recommend. The trouble with the number 2 disk drive does indeed appear to be the head alignment.

There are several adjustments necessary to align the read/write head, the 0 track stopper being the easiest one. The other adjustments are the azimuth and radial positioning. The azimuth adjustment ensures that the head is perpendicular to the disk track. The radial adjustment centers the head over the middle of the track. Both the azimuth and radial positioning require a special disk and an oscilloscope, and the procedures for these adjustments are rather lengthy. I suspect anyone with an oscilloscope and the special disk will have the directions. The rest of us have no need for the directions so I will not include them here.

In addition to the radial and azimuth positioning, two other important adjustments requiring a special disk and an oscilloscope might be considered. The first is the amplitude adjustment, which makes sure the signal is strong enough for the drive to operate reliably. The second is the comparitor offset adjustment which ensures that a 1 stored on the disk is read as a 1 and a 0 as a 0. These two adjustments are made on the analog card. Since you switched analog cards and experienced no improvement, it is highly unlikely that the amplitude or comparitor offset adjustments will solve your problem.

The question now is what to do to correct the problem. Your best bet is

Earle Hancock directs the microcomputing project at Minuteman Regional Vocational School, Lexington, MA. He has served as an advisor to the Massachusetts Association of Vocational Administrators, and belongs to a number of computer organizations. Write to him c/o inCider, Pine St., Peterborough, NH 03458.

to take the drive to an Apple dealer. At the dealership, one of two solutions can be applied. If the dealer has the equipment to do the alignments described above, the procedure should take less than one hour. If your dealer does not have the equipment, he can substitute a new disk mechanical assembly for your defective one. The cost should be under \$130.00—not too bad when you consider that everything except the case, cable and analog card are replaced.

Some of the keys on my Apple IIe keyboard have been sticking lately, as though binding. I hate to send my machine off to a repair center (my dealer says he cannot do anything). Can the key posts be lubricated with WD-40 or a silicone type of spray, perhaps applied with a cotton swab? I don't wish to do any damage or cause shorts in the keyboard.

L. Danielson  
Fort Worth, TX

Some early Apple IIe keyboards had a tendency toward sticky keys. My guess is you don't have one of those keyboards since the problem tended to show up soon after the keyboard was put into use. If you carefully remove the keycap with a chip puller or other device and sparingly apply a silicone lubricant on the key post, you may solve the problem.

Stubborn keys can in most cases be replaced. Your Apple dealer should be willing to sell the keyswitches to you for two or three dollars apiece. There are several different styles of key switches. Be sure the ones you buy fit your keyboard and your keycaps.

To replace key switches you will need to remove the case from the Apple by removing the screws around the edge of the bottom. There are nine Phillips-type screws to remove from the IIe, three on each side of the bottom and three along the front just under the lip. Once the screws are removed, turn the computer right side up and gently lift the cover up and off (much easier than on the II Plus). Four screws, two on each side, hold the

keyboard in place. Remove them and carefully pry off the keyboard from the computer.

Identify the problem keyswitch and its connections on both sides of the board. Remove the solder from the connections and remove the screw if present. Replace the keyswitch and solder into place. Reassemble the computer in reverse order from the directions above.

Soldering and de-soldering require practice and a steady hand. Never let the soldering iron be in contact with the circuit board for more than three seconds or you may lift a trace and ruin the board. If you don't have some practice with these skills let someone who has proven soldering skills help you. Regular readers of this column may recognize this warning, but I feel it bears repeating. Of course, you could replace the whole keyboard, depending on how many keys are affected.

ing unusual. I tried gently pushing each chip into its socket. No result. I put a fresh bag into the jet engine vacuum and put the hose on the discharge end. I figured that if I could not see anything on the board's up side then maybe something was on the other side. I blew air all around inside the unit and fired up the Apple. The problem was gone and has not showed up again.

There was always a cover over the entire system when not being used. I did notice that the metal grounding cloth on the cover keyboard end is not there as I had seen on other Apple II Pluses.

Well, I guess I was very lucky. I have a question about the main board. It seems so flexible being supported only from a few points. Is there a special way of replacing chips so that the board is not stressed?

A. Seidel  
Olivette, MD

I had a problem with my Apple II Plus that I would like to share with you. After a year of no failures the machine suddenly started to act up on a few DOS commands. I could SAVE and LOAD with no problems, but BSAVE and DELETE would either cause the disk drive to start talking in a strange tongue or just plain quit with "ERROR" printed out last on the screen. After this happened no commands would come back with monitor error dumps of the register. If the BSAVE command used hex numbers the drive would never stop running. All my disks had the same results. There was nothing wrong with the disk drive nor its card and contacts. Both worked well on another machine and other drives had the same fits on mine.

After calming down a few days later, I decided that either a ROM or RAM chip was bad or something physical was going on in the main board to cause a bad or short connection. I was hoping for the latter since the problem showed up after moving the machine from one end of the house to the other. So I opened up the unit and took a close look. I saw noth-

I almost didn't include this letter in the Apple Clinic. One must be careful not to divulge too many technical secrets in this business. I'd been saving the vacuum cleaner procedure for my retirement. Oh well...

Your concern over the stressing of the mother board while seating and unseating IC's is well founded. The best way to avoid the problem is to remove the board and place it on a surface covered by a ½-inch foam pad. In many cases removing the board just to replace one IC is not practical. To avoid bending the board I insert an IC part way, then rock it back and forth (along the long axis, not side-to-side) until it's seated. In this manner much less pressure is required to seat the IC correctly.

I have a problem with my Epson printer. It's an MX-80 and it works perfectly except for printing the lowercase letters that end very low, such as the g, y, p and q. The bottom of each of these letters is not printed. This problem didn't show up until I had to replace the ribbon.

Now, both the new and the old ribbon produce the same results. Do you have any suggestions?

A. Notowitz  
San Carlos, CA

Dot matrix printers form characters using "wires" positioned one above the other in the print head (Figure 1). Electromagnets drive the wires against the ribbon, which transfers some of its ink to the paper.

To print the capital letter "I" (Figure 2), wires 1 and 7 are fired.

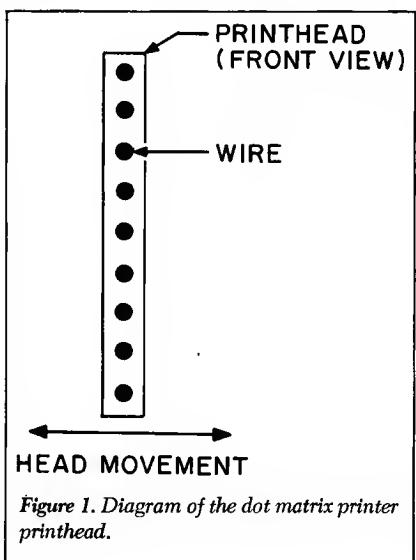


Figure 1. Diagram of the dot matrix printer printhead.

Next the print head shifts to the right one position and wires 1, 2, 3, 4, 5, 6 and 7 all fire at the same time, forming the center of the letter. Once more the print head moves to the right and wires 1 and 7 fire again, finishing the letter. In bi-directional printing the procedure is the same, only the order is reversed when printing on the reverse stroke.

The Epson MX-80 print head has nine wires but forms letters from a matrix seven dots high and five dots wide. The bottom two wires are used for descenders on lowercase letters.

Your sample print-out shows the letter j printing as it should, but the g and y were a little weak at the bottom. The j, g and y all use the bottom two wires to form the descending part of the letter (Figure

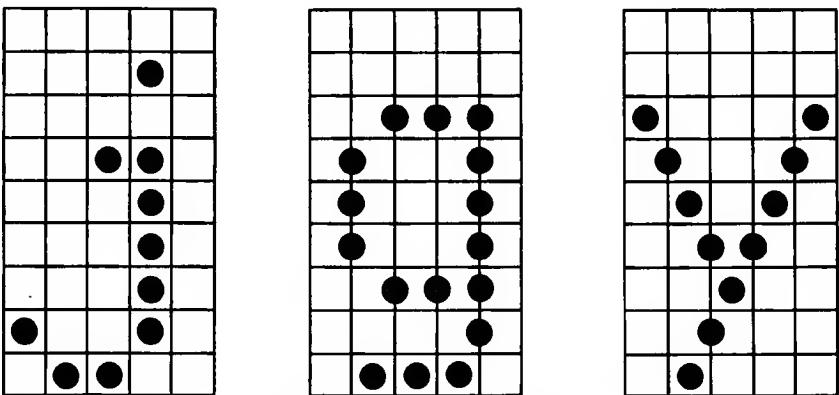


Figure 3. The printhead uses the lower seven wires to print lowercase letters with descenders.

3—note that some letters are compressed horizontally for visual effect). On your sample the letters on the left side of the page are not properly formed. On the right side of the page, however, the letters using the same wires are fully formed. If you are sure that the ribbon cartridge is properly in place and snapped down into the holder (refer to the printer manual for specific instructions), then I can only conclude that the problem resides elsewhere (preferably in another printer, right?).

The most likely cause is an improperly set paper thickness control. The Epson MX-80 can print on multiple copy paper as well as ordinary printer paper. The paper thickness control allows the print head distance from the platen to be changed to accommodate the various papers.

If you're using regular printer paper set the thickness control to the middle position. Initiate the printer self-test by holding the line feed (LF) button down while you turn the power on. Open the top lid and adjust the thickness control while you watch the letters being printed. At one of the seven positions the descenders should be fully formed. If the wires of the print head are too close to the paper the electromagnet will not have enough room to develop the full impact. Conversely, if the print head is too far from the paper the force of the strike will be spent before the wire reaches the ribbon.

The other possibility is that the platen and print head guides are out

of alignment. I doubt if changing a ribbon could cause that. If you suspect an alignment problem, see your Epson dealer.

A final note. A non-standard ribbon could cause some problems. Some of the less expensive ribbon replacements I have seen are poorly made. They often catch the print wires and jam them, causing the electromagnets to burn out. As always—*caveat emptor*.

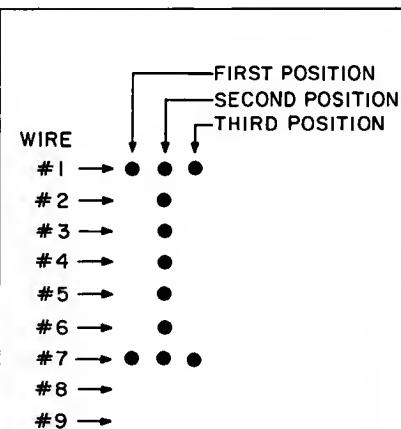


Figure 2. The printhead set to print a capital I. Note that it uses only the upper seven wires.

### Your Letters Count!

Your letters are the source of interesting problems. This column depends on those problems for its energy. Keep 'em coming! ■

# EASTCOAST SOFTWARE

*ecs... inflation-fighting prices.*

No hidden charges! No credit card fees!

## APPLE

**μ-SCI**

MICRO-SCI

**SPECIAL**

A2 Disk Drive ..... \$237.80

CAT#	LIST	SALE	CAT#	LIST	SALE	CAT#	LIST	SALE
1700 Accounting + Gen Ledger IIE	\$450.00	\$310.95	0314 EZ Port II	\$34.95	24.20	1450 Rhymes & Riddles	\$29.95	\$20.70
0080 Adam & Eve Paddles	39.95	27.50	0280 Facemaker	\$34.95	24.20	0574 Rocky's Boots	49.95	34.60
0560 Algebra I	39.95	27.60	0553 Flex Text	\$29.50	20.35	0561 Sat Word Attack 5Kills	49.00	33.90
0723 Algebra V & VI (2-Disk)	49.95	34.50	2821 Flight Simulator II	\$49.95	38.05	1303 Saturn 128K RAM Board	499.00	374.30
1142 Alien Addition (Home)	34.00	26.75	2918 Flip & File W/Lock (50)	\$39.95	23.85	0133 Screenwriter II	129.95	89.00
0013 Alpha Plot	39.50	27.25	1440 Flip-N-File (50 Disks)	\$29.95	18.85	0041 Sensible Speller IV	125.00	86.50
2598 Alphabet Zoo	29.95	20.70	2796 Fontrix	\$75.00	64.10	0400 Silicon Salad	24.95	17.25
0434 Apple Cat 2 Modem	389.00	278.10	1427 Format II Enhanced	\$150.00	108.50	1416 Smith Corona TP1 Ribbon	7.95	6.35
0151 Apple Mechanic	29.50	20.35	0554 Frame Up	\$29.50	20.35	0465 Snooper Troops I	44.95	31.15
0309 Applewriter 2 Pre-Boot	19.00	13.15	1127 Game Show	\$39.95	31.40	0138 Softcard	345.00	253.00
0090 Appli-Card (6 MHZ)	375.00	281.30	0046 General Manager II	\$229.95	158.90	0271 Software Automouth	124.95	86.35
0536 Assembly Lines (Book)	19.95	15.35	0533 Geopolitique 1990	\$39.95	27.65	0250 Spellograph	39.95	27.65
2905 Axis Assassin	35.00	26.95	0573 Gertude's Puzzles	\$44.95	31.15	1291 Spellicopter	39.95	27.70
0042 Bag of Tricks	39.95	27.65	2843 Global PLE/Beagle Bros	\$49.95	34.60	0274 Spel-Bee Games	39.95	27.70
0501 Bank Street Writer	69.95	48.35	0043 Graphics Magician	\$59.95	41.40	0274 Spys Demise	19.95	13.80
0277 Battle For Normandy	39.95	27.65	0094 Grappler +	\$165.00	128.00	2030 SSM Transend I	89.00	67.85
0278 Beagle Bag	29.50	20.35	2902 Hardhat Mac	\$35.00	26.95	2906 Standing Stories	40.00	30.75
0126 Beagle Basic	34.95	24.20	2880 Hayes Joystick Mach III	\$54.95	38.05	1277 Starwriter Film Ribbon	5.50	4.50
0658 Beneath Apple DOS	19.95	13.85	2817 Hayes Joystick Mach II	\$44.95	31.15	0435 Step By-Step	89.95	62.30
0111 Book of Apple Software '84	19.95	12.80	1437 Head Cleaning Kit	\$29.95	17.30	1447 Step-By-Step II	89.95	62.30
0096 Bookends	125.00	86.40	0197 Home Accountant	\$74.95	48.05	0100 Sticky Bear A B C	39.95	27.65
1676 BPI General Accounting	395.00	273.45	2804 Home Word	\$69.95	46.60	0099 Sticky Bear Numbers	39.95	27.65
2599 Broadsides	39.95	27.70	1684 How To Print In Applesoft	\$49.95	34.60	0292 Story Machine	34.95	24.20
0545 Bufferboard-Grappier	175.00	132.55	1589 In Search Of Amazing Thing	\$39.95	27.60	1374 Sup'Mod - Universal	69.95	53.05
1682 Buffered Grappier + (16K)	239.00	178.00	2853 Incredible Jack	\$179.00	137.70	1445 SuperText Pro (40/80)	175.00	121.15
0448 Bungle Games	39.95	27.65	0449 Juggles Rainbow	\$29.95	20.75	0001 System Saver	89.95	69.20
2805 Business Accountant 2/2E	255.00	196.15	1442 Kindercomp	\$29.95	20.70	1259 Taxan 12 in Amber Monitor	189.00	138.65
0228 Castle Wolfenstein	29.95	20.70	0003 Knight Of Diamonds	\$34.95	24.20	1258 Taxan 12 in Green Monitor	179.00	131.60
0734 CDEX How To Use Apple IIE	59.95	41.50	1693 Koala Graph Tablet - Apple	\$124.95	91.05	1528 Taxan Color Mnt W/Audio	399.00	305.50
0733 CDEX Visuals Training	59.95	41.50	0454 Korg Joystick	\$64.95	45.00	0236 Terapin Logo	149.95	103.85
0656 Chart-Macintosh	125.00	86.55	0632 Kraft Paddles	\$49.95	34.60	0137 TG Game Paddles	39.95	27.65
0386 Chess	69.95	48.35	2972 Labels - 1" White (1000)	\$9.95	6.75	0136 TG Joystick W/Toggle	59.95	41.50
2612 Chivalry	49.95	34.60	2890 Learning Bridge Made Easy	\$79.95	55.35	1330 TG Joystick W/Toggle II	64.95	45.00
0740 Compu-Math/Arith Skills	49.95	34.50	1463 Legend of Llylgamyn	\$39.95	27.65	1730 The Accountant	129.00	99.25
0654 Compu-Read	29.95	20.70	0050 Letter Perfect	\$149.95	103.60	2597 The Accountant - VCalc Infra	20.00	15.40
0743 Compu-Spell System	29.95	20.70	0403 Ltsa 2.6	\$79.95	61.75	0462 Tip Disk 'V'	20.00	13.85
0416 Compuserve Starter Kit	39.95	24.35	0310 List Handler	\$49.95	34.40	1281 Trunk Floppy Storage	29.95	21.50
1138 Computer Sat (Harcourt)	79.95	62.85	0982 Lode Runner	\$34.95	24.15	0544 Typefaces	20.00	13.85
1731 Copy 2 Plus	39.95	25.65	0194 Magic Window 2	\$150.00	103.85	0155 Typing Tutor 2	24.95	17.30
1295 Creature Creator	39.95	27.65	0192 Master Type	\$39.95	27.65	2836 Ultima 3 (Exodus)	54.95	38.05
2862 Cubit	39.95	27.65	0089 Maxell MD1 Disks-SS/DD (10)	\$51.90	28.75	0559 Ultralite	379.00	284.30
2910 Cut & Paste	50.00	38.50	2901 Memoryboard 2E/64K Exp	\$169.00	140.85	0072 Ulysses & Golden Fleece	34.95	24.00
0777 Data Capture IIE	90.00	62.35	2147 Micro Cook-Appetizers-2E	\$12.00	8.50	0062 Utility City	29.50	20.35
0059 David's Midnight Magic	34.95	24.00	2146 Micro Cook-Soups/Salads-2E	\$12.00	8.50	2952 Verbatim D5/DD (10)	46.50	37.20
1265 DB Master Version 4	350.00	242.35	0437 Micro Cookbook	\$40.00	27.65	1721 Verbatim 55/DD Hardpack	35.00	27.60
0052 Deadline	49.95	34.50	2148 Micro Cookbook II	\$40.00	27.65	0093 Verbatim 55/DD Softpack	34.00	26.95
0189 Decathlon	29.95	20.70	0692 Microline 92-P Printer	\$599.00	493.75	0063 Versatorm	389.00	263.00
0630 Delta Drawing	49.95	34.60	1509 Microline Ribbon	\$3.20	2.20	0361 Versatorm Inv. Template	49.95	34.60
1143 Demolition Division (Home)	34.00	26.75	2958 Microline Tractor Feed	\$65.00	57.70	0648 Videoterm W/5S & Inverse	319.00	247.05
2951 Dig-Dug	34.95	26.15	2802 Micromodem IIE W/Smartcom I	\$329.00	227.75	2900 Viewmaster 80 Column	169.00	140.80
1722 Disk Boxes (5 Color Coded)	25.00	12.50	0627 Microsoft Basic Mac	\$150.00	103.85	2152 Visible Computer 6502	49.95	46.90
2863 Disk Drive Ext Cable	19.75	16.70	1347 Millionaire	\$59.95	41.50	0150 Visicalc (Special)	250.00	172.00
1442 Disk Quik	29.50	20.45	1135 Minus Mission (Home)	\$34.00	26.75	1422 Visicalc IIE (Special)	250.00	172.00
1444 Diversi-DOS	30.00	5.00	1124 Mockingboard	\$129.00	105.50	0422 Visicalc Pre-Boot	49.00	33.95
0409 Dollars & Sense	100.00	69.25	1400 Moptown Hotel	\$39.95	27.65	0077 VisiTerm/VisiPlot	300.00	225.00
2939 Donkey Kong	34.95	26.15	0580 Multipan (Apple DOS)	\$250.00	173.10	1480 Wico Analog Joystick	49.95	38.40
0216 DOS Boss	24.00	16.60	0655 Multipan-Mac	\$195.00	135.00	0697 Wildcard	109.95	83.70
0983 Double Take	34.95	24.15	2903 Music Const. Set	\$40.00	30.75	2936 Wildcard 2	139.95	107.10
0424 Dow Jones Market Analyzer	350.00	293.75	0101 NEC 1215 Color Monitor	\$399.00	333.35	2937 Wildcard Plus	169.95	130.50
2877 Drol	34.95	24.20	0240 NEC 8023 Printer	\$499.00	432.90	0145 Wizard & Princess	32.95	22.75
2600 Eagles	39.95	27.70	0273 NEC 8023 Ribbon 2-Pac	\$19.95	17.10	0144 Wizardry	49.95	34.60
0360 Early Games Young Children	29.95	20.75	0423 Nibble's Away II	\$69.95	53.25	0984 Wizardplus	39.95	27.60
0213 Easy Writer (Pro)	175.00	121.00	0179 Old Ironsides	\$39.95	27.65	1532 Wizprint	24.95	17.30
1384 Echo 2 Speech Synthesizer	149.95	125.60	2908 One On One	\$40.00	30.75	0284 Word Handlers Pkg.	129.95	90.00
0811 Einstein Compiler	129.00	89.30	1328 Orange (AC Surge Protect)	\$139.95	96.90	0342 Word Juggler IIE W/Lexicheck	189.00	157.50
0661 Elementary Apple	14.95	10.35	1531 Orca/M	\$149.95	103.80	0249 Z-Plus Board	139.00	124.75
0092 Elephant Disks SS/DD (10)	37.00	24.35	2941 Pac-Man	\$34.95	26.15	0521 Zaxxon	39.95	27.60
1337 Elephant Disks SS/DD (10)	34.00	21.15	2893 Parai Printer Ext. Cable 6'	\$34.95	21.80	0296 Zork I	39.95	27.60
0729 Enhancer II/Function Strip	215.00	161.30	0635 Parallel Interface W/Cable	\$139.50	62.85	0141 Zork II	39.95	27.60
0107 Epson MX-80 Ribbon 2-Pac	28.00	12.55	0616 Personal Touch	\$89.00	70.55	0379 Zork III	39.95	27.60
0029 Essential Data Duplicator	79.95	52.00	1413 PEFS File IIE	\$125.00	85.95			
0039 Executive Secretary	250.00	173.10	1415 PEFS Graph IIE	\$125.00	85.95			
			0414 PEFS Report IIE	\$125.00	85.95			
			0372 PEFS Solutions/Ledger 2E	\$20.00	13.85			
			2809 PEFS Write II	\$140.00	96.95			
			0650 PI-3 12 in Amber Monitor	\$249.00	162.00			
			0495 PI Writer II (40/80)	\$149.95	103.85			
			2907 Pinball Const. Sel (E.A.)	\$40.00	30.75			
			1292 PIkos-Universal Interface	\$175.00	132.60			
			0659 Power of Visicalc	\$14.95	10.35			
			0584 Preschool IQ Builder I	\$23.95	16.60			
			0461 Pronto DOS	\$29.95	20.35			
			1279 Prowriter Nylon Ribbon	\$13.50	4.50			
			1446 Q-Disk Emulator	\$29.00	363.10			
			0047 Quest	\$19.95	13.85			
			2111 Ramcard 16K (MPC)	\$99.00	60.25			
			0634 Ramcard 16K Microtek	\$129.00	71.55			
			0958 Ramcard 16K Prometheus	\$99.00	56.55			
			1386 Ramcard 16K Wizard	\$95.00	62.85			
			0140 Ramcard 16K-Microsoft	\$99.95	75.00			

**CHECK ONE:**  VISA     MASTERCARD

Card# \_\_\_\_\_ Exp. \_\_\_\_\_

Telephone \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

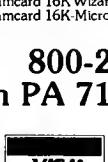
City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Please enter my order for: \_\_\_\_\_

Please specify machine: \_\_\_\_\_

Please send free catalog.



Circle 362 on Reader Service card.

**EASTCOAST SOFTWARE**

40 Hockersville Rd.  
Hershey, PA 17033

MAIL YOUR ORDER OR CALL  
(717) 533-8125  
**800-233-3237**

We Ship UPS—Shipping 1% (\$2.50 min.)  
C.O.D. Add An Additional \$2.50  
Hardware (Printers/Monitors)  
Shipping is \$2.50 + 4% (U.P.S.)

For Air Mail, Canadian, APO/FPO Orders,  
Shipping \$2.50 + 4% of Total Order (US Funds)  
PA Residents Add 6% Tax

No Minimum Order  
Visa-Mastercard-C.O.D.-Check

Prices Subject To Change  
Sorry, No Foreign Orders  
This Ad Prepared February, 1984

## Hints 'n' Techniques

# Out, Damned Cursor!

by Abram M. Plum

I was becoming more and more irritated by the persistent blinking of the cursor while my computer waited for my next response. I solved this problem on the hi-res portions of my program by using the four-line text window at the bottom of the screen. A simple VTAB1 preceding a GET statement was sufficient to hide the cursor behind the graphics screen. Some portions of my program, however, needed to use the full screen for text. Since I didn't want to translate my entire program into high-resolution graphics, I searched for another solution.

I came up with the subroutine in the Listing, which can substitute for a GET statement, but doesn't allow a cursor to appear on-screen. Line 100 continues looping back on itself until you press a key. Line 110 records the selected character and resets the keyboard strobe with a POKE before returning. The value of A\$ can then be used in the same way as the result of a GET statement.

The subroutine starting in line 200 provides a cursorless input. First, I\$ is initialized as a null string in line 200, then built up one character at a time

in line 230. Line 240 allows the user to correct errors by backspacing. This process is concluded in line 220 when the return key is pressed. The final value of I\$ is then available as the response to the INPUT statement. One advantage of this subroutine over the usual input is probably more significant than the elimination of the cursor; a comma can be entered in a string using this subroutine without resulting in an EXTRA IGNORED message.

If you are using G.P.L.E. to edit your program, you must remove the editor from memory before running a

program containing these subroutines.

I also wanted to use some sort of abbreviation or symbol to replace the frequently-repeated PRESS ANY KEY TO CONTINUE. Line 300 does this by printing an inverse > in the lower right corner of the screen. Of course, you must explain the meaning of this symbol early in your program. ■

Address correspondence to Abram M. Plum at the School of Music, Illinois Wesleyan University, Bloomington, IL 61701.

```
95 REM * 'GET' SUBROUTINE *
100 I = PEEK (- 16384): IF I < 128 THEN 100
110 I = I - 128: A$ = CHR$(I): POKE - 16368, 0: RETURN
195 REM * 'INPUT' SUBROUTINE*
200 I$ = ""
210 I = PEEK (- 16384): IF I < 128 THEN 210
220 I = I - 128: POKE - 16368, 0: IF I = 13 THEN PRINT : RETURN
230 A$ = CHR$(I): PRINT A$; : I$ = I$ + A$
240 IF I = 8 THEN PRINT CHR$(32); : PRINT A$; : L = LEN(I$) - 2: I$ = LEFT$(I$, L)
250 GOTO 210
295 REM * 'PRESS ANY KEY TO CONTINUE' SUBROUTINE*
300 POKE 2039, 62: Gosub 100: RETURN
```

Program listing. Cursor removal subroutine.

Circle 245 on Reader Service card.

### NAME BRAND PRODUCTS DISCOUNT PRICES

#### PRINTERS

**EPSON**

MANNESMANN  
TALLY

**star**  
TECHNICALS INC.

**SGM** SMITH CORONA

**OKIDATA**

**JUKI**

**Transtar**

**TOSHIBA**

#### EQUIPMENT

**Hayes'**

QUADRAM  
CORPORATION

**AMDEK**

**RB ROBOT**

**Novation**

**FRANKLIN**

**SANYO**

**Verbatim**

FREE UPON REQUEST  
DISCOUNT PRICE LIST AND INFORMATION KIT

**1-800-841-0860**

Since 1978



MicroManagement  
Systems, Inc.  
2803 Thomasville Road East  
Cairo, Georgia 31728

# UNIDIERWARE

## Software that's priced UNDER the competitions'

### APPLE PROFESSIONAL

#### HAYDEN

Just for You!

FREE DISK SLEEVE with each purchase!

The Speller	\$37
The Calendar	\$37
The Writer	\$45
The Producer	\$69
Sargon III	\$37

#### CONTINENTAL

FREE DISK SLEEVE with each purchase!

General Ledger	\$157
Accounts Receivable	\$157
Accounts Payable	\$157
Payroll	\$157
Property Management	\$349
Home Accounting	\$47
First Class Mail	\$60
Tax Advantage	\$47

#### SUNDEX

Certified Personal Investor	\$79
Certified Personal Accountant	\$79
Personal Payables	\$39

#### MICROPRO

WordStar	\$289
InfoStar	\$289
ReptStar	\$259
ProPack (WordStar, Mail Mge., Spellr, StarIndex)	\$389

#### GREAT SAVINGS ON

Monogram Dollars & Sense	\$77
TeleLearning University	\$119
CompuServe Start Kit 5 hrs.	\$29
MSI Programmable Spreadsheet	\$69
Sierra HomeWord	\$49

### APPLE EDUCATION

#### SPINNAKER

KidWriter ages 5-12	\$23
Delta Drawing ages 4-up	\$37
Alphabet Zoo ages 3-8	\$23
Hey Diddle ages 3-10	\$23
KinderCamp ages 3-8	\$23
Rhymes & Riddles ages 5-9	\$23
Story Machine ages 5-9	\$26
Search Amazing Thing ages 10-up	\$29
Snooper Troops 1 ages 10-up	\$33
Snooper Troops 2 ages 10-up	\$33
Fraction Fever ages 7-up	\$23

#### AMERICAN EDUCATIONAL COMPUTER

Learn About Sounds (grades K-3)	\$39
Wards In Reading I (grades 1-3)	\$39
Wards In Reading II (grades 1-3)	\$39
Reading Comprehension I (grades 1-4)	\$37
Reading Comprehension II (grades 3-7)	\$37
Reading Comprehension II (grades 6-8)	\$37
Vocabulary Word Builder (grades 2-8)	\$29
Grammar Word Skill (grades 2-8)	\$29
U.S. Geography Facts (grades 2-8)	\$29
World Geography (grades 2-8)	\$29
Spanish Vocabulary (grades 2-8)	\$29

#### CBS SOFTWARE

Success with Math Series	
Addition-Subtraction	\$19
Multiplication-Division	\$19
Linear Equations	\$19
Quadratic Equations	\$19
Mastering the SAT	\$99

#### HAYDEN

Ages 4-10	
MicroAddition (D&C)	\$20
MicroSubtraction (D&C)	\$20
MicroDivision (D&C)	\$20
MicroMultiplication (D&C)	\$20
Monkey See-Spell (D&C)	\$20



HARDWARE      SOFTWARE      UNDERWEAR

#### SCOTT FORESMAN

For You!

Probe Primary	\$29
Probe Intermediate	\$29
Probe Jr. H.S.	\$29
Probe H.S.-adult	\$29

#### DESIGNWARE

Spellingraph	\$29
Trap A Zaid	\$29
Creature Creator	\$29
Spellicopter	\$29

### APPLE ENTERTAINMENT

Hayden Sargon 2	\$27
Hayden Sargon 3	\$37
Epyx Temple Apshai	\$28
Epyx Jumpman	\$25
Epyx Oli Barons	\$39
Sega Star Trek	\$33
Sega Buck Rogers	\$33
Sega Congo Bongo	\$33
SubLogic Flight Simulator	\$27
InfoCom Zork 1, 2, 3	each \$26

### PERIPHERALS

#### MONITORS

For You!

BMC 13" Composite Color Plus	\$239
Amdek Color I	\$287
USI 14" Color	\$279
USI 12" Green Hi-Hi Res	\$129
USI 12" Amber Hi-Hi Res	\$139
TAXAN 12" Green	\$99
TAXAN 12" Amber	\$109
TAXAN 13" RGB Color	\$499
NEC JC 1216 RGB	\$419
NEC JB 1205 Amber	\$155

#### DISK DRIVES

RANA Elite 1	\$249
RANA Elite 2	\$385
RANA Elite 3	\$495
Controller with above	\$77

#### CONCORDE

Full High SS-SD 163K	\$239
Half High SS-SD 163K	\$249
Full High DD-DD 326K	\$339
Full High DS-DD 326K	\$339
Half High DS-DD 326K	\$359

#### MODEMS

#### NOVATION

Smart Cat 103-212 1200	\$415
212 Auto Cat	\$575
Cat	\$137
D-Cat	\$155
J-Cat	\$119
Apple Cat II (300 baud)	\$199
212 Apple Cat (1200 baud)	\$549

ORDERING & TERMS Send cashier check, money order, personal/company checks allow 3 weeks bank clearance. VISA/MasterCard accepted. Provide phone number with order. SHIPPING: Software add \$4.00 for first piece, add \$1.00 each additional piece. Hardware add 3% or \$10.00 whichever is greater. Returns must have authorization number (call 602-968-9128 for authorization number). All returned merchandise subject to restocking fee and **must** come with all original packaging. No refunds allowed after 30 days from shipping date. Prices are for cash, VISA and MasterCard add 3%. Prices subject to change without notice. All products subject to availability from manufacturers and/or suppliers. All prices in US dollars. We pay shipping on backorders.



12629 N. Tatum Blvd.  
Suite 138  
Phoenix, AZ 85032

CALL TOLL FREE  
1-800-431-8697  
602-957-3619

For Customer Service  
Call: 602-955-3857

# Paddle Reading

by Steven Lott

**I**magine this: You are writing your first program attempting to read the x and y position of the joystick. Your joystick position reading routine yields erratic results. A second joystick shows the same problems. You call the manufacturer; he claims that it is unlikely to be a hardware problem and suggests that the problem is in the software. You are at a loss for a method that will correctly read the joystick. See *inCider Letters*, June and October, to read about people who have had this problem.

The problem is in the timing circuit which reads the paddle values. It needs a short span of time between paddle readings. Without this short span of time, the second paddle value is unreliable.

To banish this bugaboo, insert an

idle loop between reading paddle 0 and paddle 1. This will provide the short span of time needed by the timing circuit. The following sample programs in Applesoft, Pascal, GraFORTH, and Assembler illustrate the solution.

Applesoft:

```
10 X = PDL(0); FOR 1 = 1 TO 10:  
NEXT 1: Y = PDL(1)
```

Pascal:

```
(*This function uses applestuff*)  
FUNCTION stick ( VAR x,y: INTEGER );  
CONST  
  stallmax = 3;  
VAR  
  stall: INTEGER;  
BEGIN  
  x := paddle ( 0 ) ;  
  FOR stall := 0 TO stallmax DO;  
  y := paddle ( 1 )  
  END (*stick*);
```

GraFORTH:

: stick ( -x/y )  
0 paddle 32 0 do loop 1 paddle;

Assembler:

```
LDX #0  
JSR $FB1E  
STY pdl0 ; paddle 0  
LDA #$32  
JSR $FCA8 ; stall for a while  
LDX #1  
JSR $FB1E  
STY pdl1 ; paddle 1
```

This problem set me back about two hours of effort. I was made aware of it because GraFORTH is so fast. I had to experiment to find a stall loop that was long enough. Applesoft is slow enough that almost any processing between PDL calls is sufficient. ■

You can write to Steven F. Lott at 416 Harvard Pl., Syracuse, NY 13210.

Circle 67 on Reader Service card.

**Attention!**  
**State of the Art®**  
**software users**  
**with Apple II, IIe**  
**your program can**  
**run 3 to 4x faster**  
**with our**  
**Speedup System**

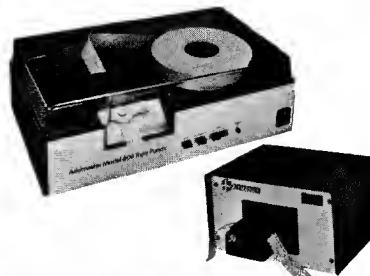


® State of the Art, Inc.

**STELLATION TWO**

The Lobero Building P.O. Box 2342  
Santa Barbara, Ca. 93120  
(805) 966-1140

Circle 166 on Reader Service card.



**Apple II + Paper Tape I/O Is This Easy**  
1010101010001010:.:.:.:.:.:.:.:.:.:.:.  
0101010101010010100:.:.:.:.:.:.:.:.:.:.  
One minute you're without, the next you're up and running! Just plug into your APPLE II PLUS. A neat and complete package.  
• Model 600-1 Punch — 50cps, rugged  
• Model 605 Reader — 150cps  
• Parallel Interface Board/Cable  
• Data Handling Program  
Code conversion available. TRS-80 package soon. ADDMASTER CORP. 416 Juniper Serra Dr., San Gabriel, CA 91776 \* 213/285-1121.

Circle 356 on Reader Service card.

REG. PRICE	SALE PRICE	DISCOUNT
28.95	28.95	\$0.00
5 1/4" DD/DD SOFT SECTOR	5 1/4" DD/DD SOFT SECTOR	5 1/4" DD/DD SOFT SECTOR
39.50	39.50	\$0.00

REG. PRICE	SALE PRICE	DISCOUNT
23.95	23.95	\$0.00
3M SCOTCH SOFT SECTOR	3M SCOTCH SOFT SECTOR	3M SCOTCH SOFT SECTOR
22.00	22.00	\$0.00



# Avoid the I.R.S.

(Inadvertently Ruined Software)

## You need software insurance.

Diskettes are fragile, and when a protected program is damaged, the results are expensive and inconvenient. If you have a backup diskette, though, you can have your Apple, IBM or compatible computer back on line within seconds...affordably. That's software insurance.

### **Copy II Plus** (Apple)

This is the most widely used backup program for the Apple. Rated as "one of the best software buys of the year" by InCider magazine, its simple menu puts nearly every disk command at your fingertips. The manual, with more than 70 pages, describes protection schemes, and our **Backup Book™** lists simple instructions for backing up over 300 popular programs. The Backup Book is expanded bimonthly, and is always available to Copy II Plus owners for only \$1.00 (and a self-addressed, stamped envelope). Best of all, Copy II Plus is still only \$39.95.

### **WildCard 2** (Apple)

Designed by us and produced by Eastside Software, WildCard 2 is the easiest-to-use, most reliable card available. Making backups of your total load software can be as easy as pressing the button, inserting a blank disk and hitting the return key twice. WildCard 2 copies 48K, 64K and 128K software, and, unlike other cards, is always ready to go. No preloading software into the card or special, preformatted diskettes are required. Your backups can be run with or without the card in place and can be transferred to hard disks. \$139.95 complete.

### **Copy II PC** (IBM)

This is THE disk backup program for the IBM PC and PC/XT that copies almost anything. Others may make similar claims, but in reality, nothing out performs Copy II PC...at any price. Copy II PC even includes a disk speed check and is another "best buy" at only \$39.95.

---

We are the backup professionals. Instead of diluting our efforts in creating a wide variety of programs, we specialize in offering the very best in backup products. So, protect your software investment, before the I.R.S. gets you.



**CENTRAL POINT  
Software, Inc.**

The Backup Professionals

**Important Notice:** These products are provided for the purpose of enabling you to make archival copies only. Under the Copyright Law, you, as the owner of a computer program, are entitled to make a new copy for archival purposes only, and these products will enable you to do so.

These products are supplied for no other purpose and you are not permitted to utilize them for any other use, other than that specified.

To order, call 503/244-5782, 8:00-5:30 Mon.-Sat., or send your order to: Central Point Software, 9700 SW Capitol Hwy, Suite 100, Portland, OR 97219. Prepayment is required. Please include \$2 for shipping and handling.

# Calendar

**May 3-6**  
**Personal Computer Userfest (Apple/IBM and compatibles)**  
Chicago, IL  
contact:  
Northeast Expositions  
822 Boylston St.  
Chestnut Hill, MA 02167  
(800) 841-7000

**May 5**  
**Computer Conference**  
Cambridge, MA  
contact:  
Nancy Roberts  
Lesley College  
29 Everett St.  
Cambridge, MA 02238  
(617) 868-9600

**May 6**  
**Logic Computer Faire**  
Toronto, Ontario  
contact:  
Loyal Ontario Group  
Interested in Computers  
PO Box 696  
Station B  
Willowdale, Ont.  
M2K 2P9  
(416) 881-8120

**May 6-9**  
**Comunicaciones Expo '84**  
Tampa, FL  
contact:  
Paula Belikove  
PO Box 860  
Westwood, MA 02090  
(617) 329-8090

**May 7-11**  
**Capitol-izing on Computers in Education**  
Washington, DC  
contact:  
Steven Raucher  
AEDS 1984 Convention  
PO Box 1248B  
Rockville, MD 20850  
(301) 279-3581

**May 10-12**  
**Byte Computer Show**  
Chicago, IL  
contact:  
Peter B. Young  
The Interface Group Inc.  
300 First Ave.  
Needham, MA 02194  
(800) 325-3330

**May 10-12**  
**Softwest 1984**  
**IBM PC & Apple**  
Denver, CO  
contact:  
Colorado Conference  
Group  
3312 Cripple Creek  
Suite C  
Boulder, CO 80303  
(303) 499-1034

**May 13-17**  
**Computer Graphics '84**  
Anaheim, CA  
contact:  
National Computer  
Graphics Assoc.  
8401 Arlington Blvd.  
Suite 601  
Fairfax, VA 22031  
(703) 698-9600

**May 15-17**  
**Mini/Micro Northeast '84**  
Boston, MA  
contact:  
Nancy Hogan  
Electronic  
Conventions Inc.  
811 Airport Blvd.  
Los Angeles, CA 90045  
(213) 772-2965

**May 16-18**  
**Teaching Math with Microcomputers**  
Miami, FL  
contact:  
NCTM  
1906 Association Drive  
Reston, VA 22091  
(703) 620-9840

**May 16-18**  
**Microcomputer Seminar**  
Miami, FL  
contact:  
NCTM  
1906 Association Drive  
Reston, VA 22091  
(703) 620-9840

**May 22-25**  
**COMDEX/Spring**  
Atlanta, GA  
contact:  
Peter B. Young  
The Interface  
Group, Inc.  
300 First Ave.  
Needham, MA 02194  
(800) 325-3330

**May 22-26**  
**Micro Expo**  
Paris, France  
contact:  
Dianne Brock  
SYBEX, Inc.  
2344 Sixth St.  
Berkeley, CA 94710  
(415) 848-8233

**June 11-15**  
**National Educational Computer Conference**  
Dayton, OH  
contact:  
Lawrence A. Jehn  
Computer Science Dept.  
University of Dayton  
Dayton, OH 45469  
(513) 229-3831

**June 12**  
**Info/Software**  
Chicago, IL  
contact:  
Clapp & Poliak  
708 Third Ave.  
New York, NY 10017

**June 12-15**  
**Understanding Microprocessor-Based Equipment and Troubleshooting**  
Minneapolis, MN  
contact:  
B.J. Green  
Micro Systems Institute  
Garnett, KS 66032  
(913) 898-6152

**June 14-17**  
**Byte Computer Show**  
Los Angeles, CA  
contact:  
Peter B. Young  
The Interface Group, Inc.  
300 First Ave.  
Needham, MA 02194  
(800) 325-3330

**June 21-22**  
**Microcomputers in Education and Training**  
Boston, MA  
contact:  
Raymond G. Fox  
SALT  
50 Culpepper St.  
Warrenton, VA 22186  
(703) 347-0055

**July 9-12**  
**1984 National Computer Conference**  
Las Vegas, NV  
contact:  
Trudy Rileu  
AFIPS  
PO Box 3691  
McLean, VA 22103  
(703) 620-8952

**July 25-29**  
**Sigraph '84**  
Minneapolis, MN  
contact:  
Gerri Salvatore  
111 East Wacker Dr.  
Chicago, IL 60601  
(312) 664-6610

# NORTHEASTERN SOFTWARE

101 William Henry Drive, Monroe, CT 06468

Circle 31D on Reader Service card.

UP TO  
50%  
DISCOUNT

## SPECIAL DISCOUNTS

Knoware	72.00
Locksmith 5.0.	73.00
Replay II	110.00
Wildcards	Call
E.D.D. (Best Nibble Copier)	68.00
CIA Files (How to Crack)	Call
Back it up III	56.00
CENTRAL POINT Copy II Plus	28.00
Apple Computers	Call

## GAMES

Program	Our Price	PRINTERS	Our Price	Program	Our Price	Business	Our Price
Centipede	25.00	APPLE	553.00	ACTION RESEARCH	150.00	Zardax	150.00
Dig Dug	25.00	Apple Dot Matrix	1,826.00	APPLE	160.00	Apple Writer Ile	160.00
Starcross	26.00	Apple Daisy Wheel	837.00	Quick File Ile	80.00	Quick File Ile	80.00
Suspended	33.00	BROTHER HR 25	775.00	ARTSCI	95.00	Magic Calc	95.00
Zork, I, II, III	25.00	DIAGLO	850.00	Magic Memory	71.00	Magic Window II	95.00
Witness	33.00		1,625.00	ARTWORKS Magic List 3.0	23.00	Incredible Jack	115.00
Deadline	33.00	620		ARTWORKS Magic List 3.0	23.00	Business Solutions	
Planefall	33.00	630		ARTWORKS Magic List 3.0	23.00	Incredible Jack	115.00
Enchanter	33.00	DYNAX		ARTWORKS Magic List 3.0	23.00	Computer Tax Service	
Infidel	33.00	DX-15	450.00	ARTWORKS Magic List 3.0	23.00	Money Street	78.00
Ultima III (Exodus)	39.00	EPSON		CONTINENTAL SOFTWARE		Continental Software	
Caverns of Callisto	26.00	FX-80	550.00	CONTINENTAL SOFTWARE		The Home Accountant	48.00
Lode Runner	24.00	FX-100	685.00	CONTINENTAL SOFTWARE		The Tax Advantage	45.00
Choplifter	24.00	MX-100	550.00	CONTINENTAL SOFTWARE		F.C.M.F.L.	65.00
Drol	24.00			CONTINENTAL SOFTWARE		F.A.S.T.	67.00
Spare Change	23.00	IDA		CONTINENTAL SOFTWARE		O'DICKENS DATA SYSTEMS	
Maze Craze	30.00			CONTINENTAL SOFTWARE		The Wall Street Plotter	94.00
Eagles	30.00	Prism B0 (Basic)	1,080.00	CONTINENTAL SOFTWARE		The Super Plotter	53.00
Queen of Hearts	26.00	Prism B0 (Full)	1,257.00	CONTINENTAL SOFTWARE		The Market Analyzer	275.00
Fortress	26.00	Prism 132 (Basic)	1,240.00	CONTINENTAL SOFTWARE		Market Manager	230.00
Pro Tour Golf	30.00	Prism 132 (Full)	1,675.00	CONTINENTAL SOFTWARE		FOX & GELLER Quickcode	189.00
Ring Side Seat	30.00	Microprism	550.00	CONTINENTAL SOFTWARE		HAYDEN Pie Writer 2.2	99.00
Cosmic Balance II	29.00	JUKI 6100	450.00	CONTINENTAL SOFTWARE		HARDCOURT 8RACE JOVANOVICH	
Bomb Alley	41.00	MANASMAN TALLY		CONTINENTAL SOFTWARE		Computer SAT	60.00
Geopolitique 1990	29.00	160L	620.00	CONTINENTAL SOFTWARE		HAYDEN SOFTWARE	
Epidemic	29.00	180L	805.00	CONTINENTAL SOFTWARE		Micro Division	22.00
North Atlantic 86	43.00	1602P	1,325.00	CONTINENTAL SOFTWARE		Micro Multiplication	22.00
Germany 1985	41.00	OKIO DATA		CONTINENTAL SOFTWARE		Micro Typing II	22.00
Broadsides	29.00			CONTINENTAL SOFTWARE		Micro Subtractions	22.00
Flight Simulator I	25.00	92P	470.00	CONTINENTAL SOFTWARE		Micro Addition	22.00
Flight Simulator II	39.00	93P	700.00	CONTINENTAL SOFTWARE		LEARNING COMPANY	
Night Mission Pinball	25.00			CONTINENTAL SOFTWARE		Rocky's Boots	34.00
Wizardry I	33.00	PROWRITER		CONTINENTAL SOFTWARE		Gretzky's Puzzles	30.00
Wizardry II (Night of Diamonds)	24.00	B51DAP (ProWriter I)	365.00	CONTINENTAL SOFTWARE		Gretzky's Secrets	30.00
Wizardry III (Legacy of Lylgarnyn)	27.00	155DAP (ProWriter II)	655.00	CONTINENTAL SOFTWARE		Bumble Plot	27.00
Police Artist	23.00	F-10 (40 cps)	1,125.00	CONTINENTAL SOFTWARE		Bumble Games	27.00
Wiziprint	19.00	F-10 (55 cps)	1,425.00	CONTINENTAL SOFTWARE		Juggles Rainbow	20.00
Crypt of Medea	23.00	SMITH CARONA TP-1	499.00	CONTINENTAL SOFTWARE		Magic Spell	24.00
Rescue Raiders	23.00	STAR MICRONICS		CONTINENTAL SOFTWARE		MICRO LAB	22.00
Zaxxon	27.00	Gemini 10X	320.00	CONTINENTAL SOFTWARE		English SAT	22.00
Pooyan	23.00	Gemini 15X	409.00	CONTINENTAL SOFTWARE		Math SAT	22.00
Gensis	23.00	Power Type	400.00	CONTINENTAL SOFTWARE		PROGRAM DESIGN	
Spy's Demise	13.50	TRANSTAR		CONTINENTAL SOFTWARE		Reading Comp.	18.00
The Spy Strikes Back	13.50			CONTINENTAL SOFTWARE		Vocabulary Builder	
The Quest	13.50	120	440.00	CONTINENTAL SOFTWARE		One: Beginning	18.00
Minit Man	13.50	130	605.00	CONTINENTAL SOFTWARE		Two: Advanced	18.00
Bouncing Kamangas	13.50	140	1,235.00	CONTINENTAL SOFTWARE		The New Step by Step	65.00
Coveted Mirror	13.50	315	470.00	CONTINENTAL SOFTWARE		Step by Step II	65.00
Mr. Cool	30.00	Pics Card	96.00	CONTINENTAL SOFTWARE		SCARBOROUGH SYSTEMS	
Congo Bongo	28.00			CONTINENTAL SOFTWARE		Songwriter	30.00
Frogger	24.00	DISK DRIVES		CONTINENTAL SOFTWARE		Picturewriter	30.00
Sammy Light Foot	27.00	APPLE Apple Add Dn	350.00	CONTINENTAL SOFTWARE		SIERRA ON-LINE	
Time Zone	65.00	MICRO SCI		CONTINENTAL SOFTWARE		Learning with Leaper	24.00
Ultima II	41.00	Disk Contr. for A2	75.00	CONTINENTAL SOFTWARE		Bop-A-Bet	19.00
The Dark Crystal	27.00	Disk Contr. for A40/70	75.00	CONTINENTAL SOFTWARE		Dragons Keep	20.00
Quest For Tires	26.00	A2	230.00	CONTINENTAL SOFTWARE		Troll's Tale	20.00
Super Taxman II	18.00	A2 w/controller	295.00	CONTINENTAL SOFTWARE		SPINNAKER SOFTWARE	
Stellar 7	24.00	A40	295.00	CONTINENTAL SOFTWARE		Trains	28.00
Fax	22.00	A40 w/controller	365.00	CONTINENTAL SOFTWARE		Facemaker	23.00
Jumpman	30.00	A70	365.00	CONTINENTAL SOFTWARE		Snooper Troops 1 & 2	30.00
Eating Machine	37.00	A70 w/controller	445.00	CONTINENTAL SOFTWARE		Story Machine	24.00
Advanced Black Jack	37.00	RANA		CONTINENTAL SOFTWARE		Kindercomp	20.00
Castle Wolfenstein	20.00	Disk Controller	95.00	CONTINENTAL SOFTWARE		Delta Drawing	41.00
Caverns of Frietag	20.00	Elite I	275.00	CONTINENTAL SOFTWARE		Kids on Keys	21.00
Spirite Simulator	26.00	Elite I w/controller	360.00	CONTINENTAL SOFTWARE		Alphabet Zoo	20.00
Air Sim III	29.00	Elite II	470.00	CONTINENTAL SOFTWARE		SUBLOGIC	
Sargon II	25.00	Elite II w/controller	535.00	CONTINENTAL SOFTWARE		Whole Brain Spelling	24.00
Sargon III	37.00	Elite III	590.00	CONTINENTAL SOFTWARE		TERRAPIN Logo	108.00
Cubit	29.00	Elite III w/controller	665.00	CONTINENTAL SOFTWARE		XEROX	
Miner 2049er	26.00			CONTINENTAL SOFTWARE		Sticky Bear Numbers	27.00
Dino Eggs	30.00	MONITORS		CONTINENTAL SOFTWARE		Sticky Bear ABC	27.00
Death in the Caribbean	26.00	AMODEK		CONTINENTAL SOFTWARE		Sticky Bear Bop	27.00
Critical Mass	27.00	Color I+	315.00	CONTINENTAL SOFTWARE		Sticky Bear Dospoites	27.00
Masquerade	26.00	Color II+	440.00	CONTINENTAL SOFTWARE		Sticky Bear Shapes	27.00
Bats in the Belfry	20.00	Color III	350.00	CONTINENTAL SOFTWARE		Sticky Bear Basket Bnc.	27.00
Mad Rat	16.00	DVM II or DVM III RGB Interface	139.00	STONWARE			
Diamond Mine	22.00	DVM 80E RGB Interface	149.00	STONWARE			
Star Maze	26.00	Amdek 300G Hi-Res	149.00	STONWARE			
Ddesta Chess 7.0	52.00	Amdek 300G Amber	160.00	STONWARE			
How about a nice game of Chess	23.00	NEC 12" Color	299.00	STONWARE			
The Serpent's Star	27.00	TAXAN		STONWARE			
Rendezvous	27.00			STONWARE			
Titan Empire	24.00	12" AMBER	135.00	STONWARE			
Beneath Apple Manor	20.00	210 Color	299.00	STONWARE			
I.Q. Baseball	19.00	RGB Vision III	450.00	STONWARE			
Zero Gravity Pinball	20.00	RGB-II Interface	140.00	STONWARE			

NO ADDITIONAL CHARGES FOR CREDIT CARD ORDERS



For Fast Delivery send cashier's check, certified check or money order. Personnel and company check allow 3 weeks to clear. Shipping - Software (\$2.50 minimum). C.O.D. add an additional \$1.75. Shipping - Hardware (please call). Alaska, Hawaii, Canada, PO, APO and FPO \$5.00 minimum. Foreign orders - \$15.00 minimum and 15% of all orders over \$100. Mastercard & Visa (include card # and expiration date). Connecticut residents add 7.5% sales tax. We ship same day for most orders. Prices subject to change without notice. School purchase orders accepted. All returns must have a return authorization number. Call 203-268-1850 to obtain one before returning goods for replacement.

If something you would like is not listed, just call. If we don't have it, we can get it.

## ORDERS ONLY

TOLL FREE - 7 DAYS/WK

**1-800-382-2242**

For Inquiries and Connecticut Orders Call  
(203)268-1850

## MEDIA

Program	Our Price
ELEPHANT 5 1/4 SSSD	18.50
MAXELL 5 1/4 SSSD	28.00
VERBATIM 5 1/4 SSSD	27.80

# Book Reviews

## Write Your Own Apple Games

by Stuart Anstis

Creative Computing Press  
One Park Ave.  
New York, NY 10016  
Softcover, \$12.95

**A**re you a beginning programmer, anxious to learn how to write your own computer games? Or are you an advanced programmer, looking to fine-tune your graphics skills and pick up a few byte-saving algorithms? Or maybe you're a teacher just trying to stay one step ahead of your best programming class?

If you're any of these—or if you just love to play games on your Apple—you'll agree that *Write Your Own Apple Games* by Stuart Anstis is a necessary addition to your computer library.

Written for people of many different skill levels, this book is a complete tutorial on how to write original games in Applesoft Basic. Unlike some of the how-to programmer aids that throw one trick after another at you in machine-gun style, Stuart Anstis clearly explains each technique with examples, helping you understand *why* they work. No blind faith is required here; you are learning methods to use again and again in all your programs.

Chapter one, "Writing Your Own Games," is the main tutorial section of the book. You'll be taught all the tricks, subroutines and algorithms needed to get started. Flowcharting, paddle controls, keeping score, animation, using random numbers, timers and Brownian motion are just a few of the topics you'll find explained.

The remaining six chapters include over fifty game and puzzle program listings with explanations and sample screen outputs. You'll shoot up enemy tanks, challenge the computer to Tic-Tac-Toe, try your hand at Stock Market, program Fireworks and Dandelions, and even make animated movies, as all the action and

graphics techniques you learned in chapter one come alive on your screen.

Although the first chapter does presuppose an understanding of Applesoft Basic (and a familiarity with hi- and lo-resolution graphics commands), even a novice without these prerequisites will find over 100 pages of game listings to provide hours of enjoyment.

Apple game enthusiasts of all kinds will consider this book a real "find."

Ken Silverstein  
Salem, NH

## Pascal Programs for Games and Graphics

by Tom Swan

Hayden Book Company Inc.  
10 Mulholland Drive  
Hasbrouck Heights, NJ 07604  
Softcover, \$15.95

**M**any Apple owners have discovered that writing computer games can be as much fun as playing them. This book provides an introduction for the Pascal programmer to the world of game software.

The book is divided into four sections. The first begins with several programs that generate abstract images on the Apple's hi-res screen. These are followed by a variety of games, including a simple shooting gallery, a challenging game similar to Break-out and a multiplayer game called Light Bikes which is reminiscent of the game in the movie *Tron*.

The second section of the book contains four utility programs. The first utility provides the means to create and edit character sets for use on the hi-res screen. The second is a general-purpose drawing program. A third allows easy editing of individual pixels on the hi-res screen. The final utility is a (slow) program for printing the hi-res screen on a letter-quality printer, the NEC 7730.

The book's third section contains descriptions of procedures in the Apple Pascal units Applestuff and Turtlegraphics, and descriptions of extensions to standard Pascal which are part of the Apple Pascal language.

The final section presents a Pascal unit which is used in earlier programs. It contains a set of routines for the text screen, including a very nice procedure for obtaining edited keyboard input.

While the programs in this book are not nearly as sophisticated as commercial offerings, they do provide much valuable information. Important techniques illustrated include using the exclusive-or operation for displaying and erasing shapes, substituting look-up tables for calculations, using random numbers to add interest to games, and collision detection. Other topics include using special character sets for animation, employing a variant record to access memory or soft switches from Pascal, using multiple character sets on the hi-res screen, and procedures for Apple's lo-res graphics.

My only complaint with this work is the inclusion of the procedure descriptions in section three. They are intended for persons who wish to run the programs under some version of Pascal other than Apple's. Anyone who is capable of implementing the procedures described (such as Draw-block) will probably not be interested in the games presented earlier. Leaving out this material would have shortened the book by 20 percent and presumably lowered its cost.

The text and programs are well-written, and the program listings are quite legible. For many, the utilities in sections two and four will be worth the price of the book. A pair of companion disks containing the source code for all of the programs makes it even more attractive. If you want to have fun and learn some new Pascal programming techniques, this book is for you. ■

James Reese  
Falls Church, VA

## Book Reviews

### The Naked Computer

Jack B. Rochester and John Gantz  
William Morrow and Company Inc.  
105 Madison Ave.  
New York, NY 10016  
Softcover, \$15.95

**T**ake a good long look at a computer. Does it have input, output, a bit of binary? No? Then you are not taking a look at a computer." That profound truth, quoted from a sixth grade teacher's collection of her students' pronouncements, is one of the thousands of reasons you should quickly dash out and make this collection of biggest, oldest, heaviest, lightest, quickest, wittiest, and other superlative computer-related memorabilia your own.

What a pleasure to read and review a book like this! From the first page to the last period you'll be shaking your head at the unbelievable, smiling at the idiosyncratic, laughing at the preposterous, and jumping up from the chair to enlighten your spouse (children, relative, neighbor, or anyone that will listen) on the most recent absurdity that has tickled your funny bone.

In *The Naked Computer* authors Gantz and Rochester have assembled a collection of computer information that spans the years from Joseph Henry and Charles Babbage to IBM and Apple. It's all here—the people who started it, the machines they made and the companies they created, the kluges that couldn't or wouldn't, the robots that tried, the crooks that did, the war machines that, I pray, never do, from Ada's insights to Wozniak's amnesia. Curl up some evening with this enchantment and read till dawn. If ever a book rated a "couldn't put it down" reward, this is it. On the other hand, you can keep it by the easy chair and read a page or two during a TV commercial with just as much pleasure.

The chapters divide up the collection into some semblance of order so if you'd like to concentrate on computer crime, military concoctions,

communications, IBM, the future, robots, history, medicine, banking, or whatever, you can jump in anywhere and splash around to your heart's content. The index will help if you're pursuing a specific subject. Apple and Apple Inc. have 12 listings but I found a few additional ones like the story of programmer Paul Lutus whose 1300-foot extension cord powers his Apple in the Cascade Mountains.

The book is *fun* from cover to cover, so I did not at first suspect that here, in these 300-plus pages, was a history of the computer revolution and the people and events that sparked it. It is a microcosm of the industry, presented as no history book has ever done, with facts and humor intermingled so ingeniously that one never suspects that knowledge and education are being dispensed. An example: The Social Security Administration's five-acre complex in Woodlawn, Maryland is a "veritable factory of computer errors," with 500,000 reels of tape, whose computer programs have overpaid \$600 million to recipients and... oh, read it yourself and learn and laugh through the tears.

Not just a collection of facts, fascinating as they may be, Gantz and Rochester have provided their own commentary that provides for some additional illumination, insight, and humor about that infamous machine, *The Naked Computer*. I hope the authors will update this collection every few years, just to keep us all from taking ourselves too seriously. And, because I just can't resist it, here's one parting quote: "The most entertaining event at the 1979 National Computer Conference was a contest to see who could build a mechanical mouse that could make the best total time running thrice through a maze.... In a fitting tribute to mouse over mind, however, the contest was won by a very dumb but very fast mouse that merely hugged the wall, trying all the corridors, until it got out."

Art Ude  
Stoddard, NH

Circle 146 on Reader Service card.

## GOLEM COMPUTERS

\*\*\*\*\*  
APPLE

### SOFTWARE/HARDWARE AT SUPER SAVINGS

\*\*\*\*\*  
PLACE ORDERS TOLL FREE

1-800-345-8112  
PA 1-800-662-2444



VISA

ARCADE	LIST PRICE	GOLEM PRICE
ZAXXON	39.95	27.97
CHOPFLUTER	34.95	24.47
BEAGLE BAG	29.50	20.65
LODE RUNNER	34.95	24.47
STELLAR-7	34.95	24.47
MINER 2049er	40.00	28.00

ADVENTURE	LIST PRICE	GOLEM PRICE
ZORK I, ZORK II	ea. 39.95	27.97
QUEST, TRANSYLVANIA	ea. 19.95	13.97
ENCHANTER	49.95	34.97
WITNESS	49.95	34.97

STRATEGY	LIST PRICE	GOLEM PRICE
FLIGHT SIMULATOR II	49.95	34.97
CASTLE WOLFENSTEIN	29.95	20.97
SARGON III	49.95	34.47

FANTASY	LIST PRICE	GOLEM PRICE
WIZARDRY	49.95	34.97
ULTIMA I, II, III	ea. 59.95	41.97
KNIGHT OF DIAMONDS	39.95	24.47
LEGACY OF LYLCAMYN	39.95	27.97

HOBBY	LIST PRICE	GOLEM PRICE
BEAGLE BASIC	34.95	24.47
GRAPHICS MAGICIAN	59.95	41.97
UTILITY CITY	29.50	20.65
ZOOM GRAPHICS	49.95	34.97
APPLE MECHANIC	29.95	20.97
PRONTO OOS	29.95	20.97
OOS BOSS	24.00	16.80

HOME	LIST PRICE	GOLEM PRICE
HOME ACCOUNTANT	74.95	52.47
ASCI EXPRESS: THE PROFESS	129.95	90.97
HAYES TERMINAL PROGRAM	99.00	69.30
CROSSWORD MAGIC	49.95	34.97
VISITER	100.00	70.00
MICRO TERMINAL	84.95	59.47

HOME EDUCATION	LIST PRICE	GOLEM PRICE
MASTER TYPE	39.95	27.97
SNOOPER TROOPS I, II	ea. 44.95	31.47
TERRAPIN LOGO	149.95	104.30
EARLY GAMES FOR YOUNG CHILDREN	29.95	20.97
ROCKY'S BOOTS	49.95	34.97
ALGEBRA I, ALGEBRA II	ea. 39.95	27.97

WORD PROCESSOR	LIST PRICE	GOLEM PRICE
BANK STREET WRITER	64.95	48.97
SCREEN WRITER II	129.95	90.97
WORLSTAR	395.00	276.50
MAGIC WINDOW II	149.00	104.30
SENSIBLE SPELLER	125.00	87.50
PFS.WRITE	125.00	87.50

BUSINESS	LIST PRICE	GOLEM PRICE
VISICALC	250.00	175.00
PFS.FILE	125.00	87.50
MULTIPLAN	275.00	192.50
PFS.REPORT	125.00	87.50
DB MASTER	229.00	160.30
PFS.GRAPH	125.00	87.50

SOFTWARE SPECIALS	LIST PRICE	GOLEM PRICE
MICROMODEM II/SMARTCOM (HAYES)	240.00	
GRAPLER + (ORANGE MICRO)	125.00	
INOU'S GT DISK DRIVE (INOU SYSTEMS)	240.00	
COLOR 1+13" LOW RES COLOR MONITOR (AMOEK)	300.00	
GEMINI 10X PRINTER (STAR MICRONICS)	279.00	
GEMINI DELTA 10 PRINTER (STAR MICRONICS)	479.00	
KOALA GRAPHIC TABLET W/SFT (KOALA)	95.00	
MACH III W/FIRE BUTTON JOYSTICK (HAYES)	40.00	

ALL ITEMS SUBJECT TO AVAILABILITY  
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

To order call toll free or send check or money order. VISA/MC, C.O.D. orders welcome. Personal and company checks allow 10 working days to clear. Specify if to backorder or to send refund. California residents add 6% sales tax. Include phone number with order. Shipping and handling: All shipments U.P.S. if possible. Continental U.S. add \$2.00 for 1 to 3 items; 4 to 6 items add \$3.00; 7 to 10 items add \$4.00. F.O.B. Alaska, Hawaii and Canada add \$2.00 per item. 2nd day air add \$1.50. All hardware purchases are prepaid or VISA/MC, shipped U.P.S. include 5% for shipping & handling. Foreign orders add 10% and include check drawn on U.S. bank. C.O.D. orders add \$1.65. Mail orders to:

**GOLEM COMPUTERS**

P.O. BOX 6698  
WESTLAKE VILLAGE, CA 91359

Apple is a trademark of Apple Computers Inc.

# Hardware Reviews

## Amdisk-I Micro-floppy Disk Drive

If you've delayed buying that second drive because of the high price of Apple's Disk II, a small solution may be at hand. I say *small* because I am referring to Amdek's 3-inch disk drive—the Amdisk-I Microfloppy.

The Amdisk-I measures 7½-by-4-by-2 inches. Three Amdisk-I's can fit inside the Disk II. Storage capacity (143K) and performance functions are identical to the Apple product. Other than its inability to use 5¼-inch disks, the Amdisk-I can do whatever the Disk II can.

Amdisk-I comes with an attached cable that connects to the Apple drive controller board. Instead of a drive door, the Amdisk-I uses a small slot slightly larger than the disks. When you insert a disk, two metal strips flip back and lock it in place. To remove the disk, press the eject button and the disk pops out.

The disks are 4-by-3½ inches. Enclosed in a hard plastic shell, the recording media is only exposed when you insert the disk into the drive. A thin metal plate covers the areas usually exposed on typical 5¼-inch disks. The centering ring is also made of plastic.

Each disk has two sides and can store up to 143K per side. In place of Tyvek disk sleeves, the disks come with form-fitting, clear plastic bags for additional protection. An attached label allows you to record program names on each disk. Similarly, the sticky, write-protect tabs have been eliminated. On the back of each disk are two plastic switches labeled A and B. Flip the A switch and that side becomes write-protected. Flip it back and you may write normally.

The Amdisk-I performs superbly. Although the sound differs from the Disk II, the volume is no greater. The disks are well-engineered and sturdily constructed, representing an advance over the flimsy 5¼-inch floppies. The closed drive slot should go a

long way toward protecting the drive mechanism from dust and other contaminants.

The Amdisk-I makes an excellent second drive for those expanding their system's storage capacity. Suggested retail price is \$299 for the drive and \$6.99 per double-sided disk. The Amdisk-I is manufactured by Amdek Corporation, 2201 Lively Blvd., Elk Grove Village, IL 60007. ■

Steven A. Schwartz  
Pittsburgh, PA

## KoalaPad

How many of you have been dying to have your own graphics tablet, but were stopped cold by the price? Well, have I got a deal for you! Koala Technologies Corporation has introduced a low-cost miniature touch tablet and graphics package. You can finally give vent to those artistic urges without having to take out a second mortgage.

The KoalaPad measures 6-by-8-by-1 inch and has a 4½-inch square active drawing surface. Since it weighs only a pound and comes with a 4-foot cord, you can easily and comfortably hold it in your hand or lap. Connection to the Apple requires approximately 15–30 seconds; the pad simply plugs into the Apple game port. With its two firing buttons, it can even be used as a substitute joystick with most games.

How does it work? The company calls it a "position sensing device." When you touch the device's surface with your finger or a special plastic stylus, the Apple senses the pressure and translates it into screen coordinates in much the same way that it reads joysticks or paddles. KoalaPad accepts custom tablet overlays—thin plastic sheets which pop into the pad's drawing surface. Each overlay has a number of program operations illustrated on it—sort of a touch-and-go menu. One example mentioned in the promotional literature is a pad of 40 programmable function keys.

To use the KoalaPad as a graphics

tablet, Koala includes the Koala Painter program as part of the package. After booting the disk, you see a hi-res menu. To make a selection, touch the corresponding area on the pad and press the firing button to lock in your choice. To draw, use combinations of finger or stylus pressure and button presses. To change selections, return to the menu.

The program offers many options. Your artwork may use either of two color sets. You have eight different "brushes" for different stroke sizes and shapes. For fine detail work, use the "magnify" mode. A "fill" command lets you put color into any completely enclosed area of your picture.

You also get shape-drawing tools. You can draw individual lines, connected lines, rays (a number of lines emanating from a single point), rectangular or square frames (filled or outlined), and circles (filled or outlined), each as a single menu option. If you don't like what you've created, use the "erase" command.

Need help with using one of the options? On-line help is available. Saving and loading pictures is also performed from the menu. The entire program (with the exception of file names) is under the control of the KoalaPad. With practice, even children can use the Koala Painter.

I ran into some real problems with Koala Painter's "frame" command. What you draw, unfortunately, is not always what you get! To make an illustration stand out, I wanted to enclose it in a frame. Every time I followed the procedure to draw a full-screen frame, however, it disappeared from the screen. This led me to believe that I must be performing the touch and button operations incorrectly, further confusing me on the other commands. The problem, apparently, is that the full screen isn't available to you, at least with the "frame" command.

Drawing in "magnify" mode is unnecessarily difficult. When you switch to this mode, the entire picture is replaced by an enlarged portion of the original. The problem is one of guessing which portion you are viewing. Also, I'd advise against ap-

plications which require lettering or labeling, unless you have an extraordinary amount of free time on your hands. It may be possible, however, to load the picture and overlay an existing character set from one of the many commercially available programs.

In general, though, both products perform very well. With practice and judicious erasing (re-drawing over errors using the background color), you should be able to use Koala Painter to create detailed pictures, pie charts, or almost any type of hires application you desire. Watch for new application programs. The promotional literature mentions games, education, and finance. The Koala Pad and Koala Painter are a bargain—an excellent alternative for the budget-minded among you. Retail price for the package is \$125. They are manufactured by Koala Technologies, 4962 El Camino Real, Suite 125, Los Altos, CA 94022. Versions are available for Apple II, II Plus, and IIe. ■

Steven A. Schwartz  
Pittsburgh, PA

---

## Inforunner Riteman Printer

The Inforunner Riteman is a small, light dot-matrix printer and everything about it seems slightly miniaturized. Its low profile appeals to the computer user with limited space or a need to carry the printer. Its low price, too, is an attraction.

The Riteman does not have all the features of the latest matrix printers with higher price tags. It does, however, offer more than plain vanilla printing at the standard 10 characters per inch (cpi). Compressed characters are printed at 16 cpi and expanded characters at 5 cpi. Riteman combines these two variations, printing expanded compressed characters at 8 cpi. It is able to print characters in italic rather than block style for a total of eight different character sizes and shapes.

Characters are formed using a matrix of dots five wide by nine high. (The lowest two dots are used only for descenders on the lowercase letters g, j, p, q, and y.) Current printers use a denser matrix for character quality. Those printed by the Riteman are squarish and noticeably dotty, but crisp and easy to read. The dots are pronounced along horizontal strokes within the standard 10-cpi characters.

For denser characters, the Riteman offers emphasized and double-strike printing modes. These can be used separately or combined, with some sacrifice of printing speed. In the emphasized mode, each character dot is printed twice, because the dots overlap horizontally for a solid, darker look. Diagonal strokes look the most bumpy.

After each line is printed in the double-strike mode, the printhead returns to the starting position and prints the line again. Between passes, the paper advances slightly (1/288th inch). The repetition makes the vertical strokes more solid, and produces darker characters. The horizontal strokes remain fairly dotty.

The most solid characters combine emphasized and double-strike printing modes. They're best used when words need to be emphasized within text, such as for headings and titles.

One additional print-style feature is the ability to print subscript and superscript text. This is not simply the ability to print normal characters a half line below or above the current line. The Riteman prints half-height characters in the lower or upper half of the line to allow you the use of subscripts and superscripts within single-spaced text without printing over part of another line.

Printing speed is rated by the manufacturer at 120 characters per second (cps) in the normal printing mode. There is a pause between printing lines, because there is no extra built-in memory to receive characters for the next line while the current line is printed. This reduces the overall printing speed, but offers no particular problem.

The double-strike mode slows

down printout speed by half. Emphasized printing is 25 percent slower than the normal mode.

Other Riteman commands:

- Underline characters.
- Adjust spacing between lines, by increments as small as 1/288th inch.
- Control the paper-out sensor switch.
- Set form length in lines per page or inches per page.
- Set horizontal tab stops.
- Set line spacing between printed pages.
- Allow only one-way rather than bidirectional printing (for maximum precision in aligning columns).
- Activate one of three dot-addressable graphics modes: single-density with 480 dots per line, double-density with 960 dots, or "one-to-one" with 576 dots.

Features *not* available on the Riteman are proportional character spacing, reverse line feeding, and programmable vertical forms control. The Riteman comes equipped with only a one-line memory buffer for storing characters.

The Riteman accepts paper up to 10 inches wide by sheet, in rolls, or fan-folded. (It only prints across an 8-inch line.) Sprockets guide 10-inch perforated-edge paper, but can be moved for rolls or single sheets. The tractor feed is necessary for perforated-edge paper less than 10 inches wide.

Feeding single sheets of paper is bothersome. Pulling the rollers away from the platen releases the platen's grip on the paper. And once the paper is held between rollers and platen, it goes through a slot in the hinged top cover before the cover is closed.

Twelve internal switches set various options. These include default power-on settings for line spacing, character pitch, printing mode, paper perforation skip, and international character set (United States, France, Germany, or United Kingdom). You can also choose to print the zero character with or without a slash.

The Riteman is manufactured by Inforunner, 1621 Stanford St., Santa

# UPGRADE

## get IIe features on your apple II

up to 5 keyboard features with the  
**REPEATERRRR+™**

**Auto Repeat:** Invaluable. Repeats any keypress, including control characters for scrolling, rubout, etc. Adjustable delay to match your typing touch. ON/OFF control.

**High Speed Cursor:** Makes Apple's REPT key a speed control to double the repeat rate of any keypress. Zip through text or across a VisiCalc spreadsheet to get there fast. A must for 80 column displays.

New option for the REPEATERRRR:  
**SHIFT-key Modification:** SHIFT as you should. Get the "standardized" connection (SHIFT-key to Game I/O) while leaving the Game I/O open with our plug-in connector. Supported by most popular word processors (Apple Writer II, Word Handler, Screen Writer II, etc.) and many other programs. Works only with certain software and/or most 80 column boards.

Easy installation. Open top and plug onto 25-pin connector between keyboard and encoder board (fits Rev. 7 or later).

**REPEATERRRR**  
without SHIFT-key modification **\$24.95**

**REPEATERRRR+**  
with SHIFT-key modification **\$34.95**



**TO ORDER:** Ask your local dealer or order direct.

Add \$2 per order shipping/handling (\$5 foreign). Ohio orders add 6.5% sales tax. Check, MasterCard VISA (incl. card no. & exp. date), 30 day trial → full refund if not satisfied. One year warranty.

**HOME**

**HIGHORDERMICROELECTRONICS CORP.**

17 RIVER ST. CHAGRIN FALLS OHIO 44022  
PHONE 216-247-3110

Trademarks: Apple/Apple Computer, Inc., Screen Writer II/Sierra On-Line, Inc., Word Handler/Silicon Valley Systems Inc., VisiCalc/VisiCorp.

Circle 264 on Reader Service card.

# BACK UP YOUR DISKS

EDD is the most powerful disk duplicator available for your Apple® computer. Unlike the copycards, which only copy single load programs, EDD backs up more of your entire disk. EDD can back up more protected software than all other copy programs or copycards put together. Since EDD is automatic, you will no longer have to change parameters to duplicate most disks, although every parameter is fully documented in our extensive manual. We also provide updated EDD program lists.

**\$79.95**

Plus \$2 postage  
(Overseas \$5)  
CA residents add 6%

Runs on: 48K Apple II,  
II plus, IIe, or III (emulation mode) with 1 or 2,  
3.5 drives

## ESSENTIAL DATA DUPLICATOR III™

- EDD rarely needs parameter changing
- Automatically finds the beginning of each track
- Unlike any of the Copycards, EDD backs up the entire disk, not just what is in memory
- Accurately finds "auto-sync" bytes and their lengths
- Can copy 1/4 and 3/4 tracks

TO ORDER OR FOR MORE INFORMATION, CALL (707) 257-2420

**UTILICO MICROWARE**

3377 Solano Ave., Suite 352, Napa, CA 94558

## Hardware Reviews

Monica, CA 90404. It sells for \$399. I'm impressed with the features and performance packaged in this small, inexpensive printer. If you need acceptable, printed output for anything up to informal correspondence, the Riteman is a good choice. ■

Jon Voskuil  
Milford, NH

## Apple Color Plotter

The Apple Color Plotter is a desktop machine that draws pictures under control of any computer that has a serial port. It will draw on sheet paper or transparent film as large as 11-by-17 inches. As your computer sends its commands, the plotter slides the paper back and forth while moving colored pens at right angles to the paper movement. It has built-in commands for drawing lines, circles, arcs, and symbols in any combination of available colors. It also writes text anywhere on the sheet in any size, vertically, horizontally, or at any angle in between. You can change the character aspect ratio for special effects, and you can tilt the lettering from vertical to create italics.

The plotter has commands for coordinate axis drawing when you want to make an X-Y graph. It will generate tick marks automatically to the scale you desire. For drawing data lines there are nine built-in line patterns including dotted and dashed lines. You can generate custom line patterns, too.

### Pens and Capper

The pen carrier holds four pens. At present there are eight different colors available in two different widths. Special pens are available to draw on transparent film. The carrier looks like a gun turret with the points going in four directions. The plotter selects the pen by turning the turret. Since the pens are somewhat difficult to remove from the carrier, Apple has supplied a neat pen capper that covers all four pens at the flick of a wrist. The pens dry out quickly, so this is a welcome accessory.

# Apple Peripherals Are All We Make

## That's Why We're So Good At It!

### THE NEW TIMEMASTER II



Automatically date stamps files with PRO-DOS

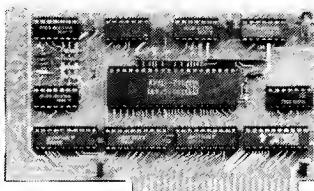
NEW 1984 DESIGN  
An official PRO-DOS Clock

- Just plug it in and your programs can read the year, month, date, day, and time to 1 millisecond! The only clock with both year and ms.
- NiCad battery keeps the TIMEMASTER II running for over ten years.
- Full emulation of ALL other clocks. Yes, we emulate 8rand A, 8rand T, 8rand P, 8rand C, Brand S and Brand M too. It's easy for the TIMEMASTER to emulate other clocks, we just drop off features. That's why we can emulate others, but others CAN'T emulate us.
- The TIMEMASTER II will automatically emulate the correct clock card for the software you're using. You can also give the TIMEMASTER II a simple command to tell it which clock to emulate (but you'll like the Timemaster mode better). This is great for writing programs for those poor unfortunate that bought some other clock card.
- 8basic, Machine Code, CP/M and Pascal software on 2 disks!
- Eight software controlled interrupts so you can execute two programs at the same time (many examples are included).
- On-board timer lets you time any interval up to 48 days long down to the nearest millisecond.

The TIMEMASTER II includes 2 disks with some really fantastic time oriented programs (over 40) including appointment book so you'll never forget to do anything again. Enter your appointments up to a year in advance then forget them. Plus DOS dater so it will automatically add the date when disk files are created or modified. The disk is over a \$200.00 value alone—we give the software others sell. All software packages for business, data base management and communications are made to read the TIMEMASTER II. If you want the most powerful and the easiest to use clock for your Apple, you want a TIMEMASTER II.

**PRICE \$129.00**

### Z-80 PLUS!



- TOTALLY compatible with ALL CP/M software.
- The only Z-80 card with a special 2K "CP/M detector" chip.
- Fully compatible with microsoft disks (no pre-boot required).
- Specifically designed for high speed operation in the Apple IIe (runs just as fast in the II+ and Franklin).
- Runs WORD STAR, dBASE II, COBOL-80, FORTRAN-80, PEACHTREE and ALL other CP/M software with no pre-boot.
- A semi-custom I.C. and a low parts count allows the Z-80 Plus to fly thru CP/M programs at a very low power level. (We use the Z-80A at fast 4MHZ.)
- Does EVERYTHING the other Z-80 boards do, plus Z-80 interrupts.

Don't confuse the Z-80 Plus with crude copies of the microsoft card. The Z-80 Plus employs a much more sophisticated and reliable design. With the Z-80 Plus you can access the largest body of software in existence. Two computers in one and the advantages of both, all at an unbelievably low price.

**PRICE \$139.00**

- Expands your Apple IIe to 192K memory.
- Provides an 80 column text display.
- Compatible with all Apple IIe 80 column and extended 80 column card software (same physical size as Apple's 64K card).
- Can be used as a solid state disk drive to make your programs run up to 20 times FASTER (the 64K configuration will act as half a drive).
- Permits your IIe to use the new double high resolution graphics.
- Automatically expands Visicalc to 95 K storage in 80 columns! The 64K config. is all that's needed, 128K can take you even higher.
- PRO-DOS will use the MemoryMaster IIe as a high speed disk drive.

### MemoryMaster IIe 128K RAM Card

- Precision software disk emulation for Basic, Pascal and CP/M is available at a very low cost. NOT copy protected.
- Documentation included, we show you how to use all 192K. If you already have Apple's 64K card, just order the MEMORYMASTER IIe with 64K and use the 64K from your old board to give you a full 128K. (The board is fully socketed so you simply plug in more chips.)

**MemoryMaster IIe with 128K**

**\$249**

**Upgradeable MemoryMaster IIe with 64K**

**\$169**

**Non-Upgradeable MemoryMaster IIe with 64K**

**\$149**

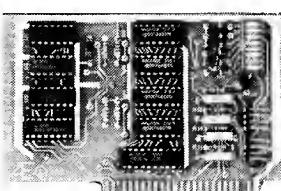
Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products work in the APPLE IIe, II, II+ and Franklin. The MemoryMaster IIe is the only Applied Engineering also manufactures a full line of data acquisition and control products for the Apple; A/D converters and digital I/O cards, etc. Please call for more information. All our products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle THREE YEAR WARRANTY.

Texas Residents Add 5% Sales Tax  
Add \$10.00 If Outside U.S.A.  
Dealer Inquiries Welcome

Send Check or Money Order to:  
**APPLIED ENGINEERING**  
P.O. Box 798  
Carrollton, TX 75006

Call (214) 492-2027  
8 a.m. to 11 p.m. 7 days a week  
MasterCard, Visa & C.O.D. Welcome  
No extra charge for credit cards

### Super Music Synthesizer Improved Hardware and Software



- Complete 16 voice music synthesizer on one card. Just plug it into your Apple, connect the audio cable (supplied) to your stereo, boot the disk supplied and you are ready to input and play songs.
- It's easy to program music with our compose software. You will start right away at inputting your favorite songs. The Hi-Res screen shows what you have entered in standard sheet music format.
- Now with new improved software for the easiest and the fastest music input system available anywhere.
- We give you lots of software. In addition to Compose and Play programs, 2 disks are filled with over 30 songs ready to play.
- Easy to program in 8basic, to generate complex sound effects. Now your games can have explosions, phaser zaps, train whistles, death cries. You name it, this card can do it.
- Four white noise generators which are great for sound effects.
- Plays music in true stereo as well as true discrete quadraphonic.
- Full control of attack, volume, decay, sustain and release.
- Will play songs written for ALF synthesizer (ALF software will not take advantage of all our card's features. Their software sounds the same in our synthesizer.)
- Our card will play notes from 30HZ to beyond human hearing.
- Automatic shutdown on power-up or if reset is pushed.
- Many many more features.

**PRICE \$159.00**

### Viewmaster 80

There used to be about a dozen 80 column cards for the Apple, now there's only ONE.

- TOTALLY Videx Compatible.
- 80 characters by 24 lines, with a sharp 7x9 dot matrix.
- On-board 40/80 soft video switch with manual 40 column override.
- Fully compatible with ALL Apple languages and software—there are NO exceptions.
- Low power consumption through the use of CMOS devices.
- All connections are made with standard video connectors.
- Both upper and lower case characters are standard.
- All new design (using a new Microprocessor based C.R.T. controller) for a beautiful razor sharp display.
- The VIEWMASTER incorporates all the features of all other 80 column cards, plus many new improvements.

	PRICE	BUILT IN SOFTSWITCH	SHIFT KEY SUPPORT	LOW POWER DESIGN	80 COLUMN MODE	720 DOT MATRIX	LIGHT PEN INPUTS	48 COLUMN OVERRIDE	INVERSE CHARACTERS
VIEWMASTER	179	YES	YES	YES	YES	YES	YES	YES	YES
SUPERTERM	MORE	NO	YES	NO	NO	NO	NO	YES	YES
WIZARD80	MORE	NO	NO	NO	NO	YES	NO	YES	YES
VISION80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX80	MORE	YES	YES	NO	NO	YES	NO	NO	YES
SMARTER	MORE	YES	YES	NO	NO	NO	YES	YES	NO
VIDEOTERM	MORE	NO	NO	YES	NO	YES	YES	NO	YES

The VIEWMASTER 80 works with all 80 column applications including CP/M, Pascal, WordStar, Format II, EasyWriter, Apple Writer II, VisiCalc, and all others. The VIEWMASTER 80 is THE MOST compatible 80 column card you can buy at ANY price!

**PRICE \$179.00**

The control panel on the plotter lets you select the mode of operation and allows you to do some simple drawing. There are lights on the panel to indicate the mode of operation and error conditions.

Paper alignment is done with index marks on the plotter bed. Inserting and aligning the paper takes about two or three seconds. For larger paper there is a detachable wire rack to keep the paper from flopping around. When using the large paper you will need a lot of room on top of your desk.

You won't be able to use preprinted graph paper with this plotter. It is impossible to position the paper precisely enough. But I found I didn't need that kind of paper, anyway.

The only interface available with this plotter is serial RS-232C with hardware handshaking. The cable included with the system is designed

for an Apple Super Serial Card. Having a Prometheus Versacard with a serial port, I had to make a special cable using four wires to make the system work.

### Easy Commands

Commands for the Apple Color Plotter are in plain text format—that is, ordinary alphanumeric characters that you can read. It recognizes 25 different two-letter codes to start a command. If required, the command is followed by a list of arguments, separated by commas. A return is normally used to terminate a command. For printed characters, it must be a control-C.

The commands are not too hard to understand. For instance, DA 100,200 means to Draw Absolutely from where the pen is to X=100 and Y=200. This draws a line between those two points. MA means to Move

Absolutely without drawing. PS is the Pen Select command. CA draws a circle, while AC draws an arc. PL is Print Lettering.

Among the interesting features of this plotter are the Viewport and Window capabilities. The Viewport command advises the plotter of the absolute working area on the physical sheet of paper. If you want the drawing to fit in a certain portion of the paper, tell the plotter the coordinates of the corners of that area. Then use the Window command to scale the viewport to any dimension you desire. The plotter will draw to the new scale, but not outside the viewport. You can also use the Viewport and Window commands to create text of different sizes and aspect ratios.

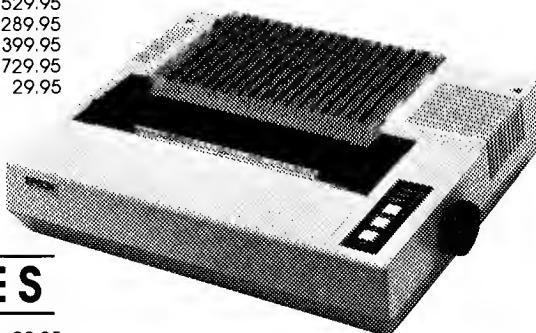
The plotter has an international education; that is, it writes in other languages besides English. Included

Circle 134 on Reader Service card.

## PRINTERS

EPSON FX 80 .....	529.95
EPSON RX 80 .....	289.95
EPSON RX 80 FT .....	399.95
EPSON FX 100 .....	729.95
ADJ. TRACTOR (FX) .....	29.95

## Epson FX-80



## INTERFACES

Microtek GX .....	99.95
Microtek Dumpling 16K .....	149.95
Grappler + .....	129.95
Buffered Grappler .....	199.95
P-KASO .....	139.95

## MONITORS

AMDEK 300 AMBER .....	169.95
AMDEK 300 GREEN .....	159.95
COMREX 5600 AMBER .....	149.95
COMREX 6600 RGB W/Apple Interface Card & Cable .....	329.95

## MISCELLANEOUS HARDWARE

VIDEX VIDEOTERM .....	199.95
VIDEX ULTRATERM .....	289.95
ALS Z-CARD .....	139.95
ALS CP/M 3.0 64K .....	299.95
WILDCARD II .....	99.95
HAYES MICROMODEM IIE .....	259.95
KENSINGTON SYSTEM SAVER .....	69.95
KOALA PAD .....	94.95
KRAFT JOYSTICK .....	47.95
SUPERSPRITE W/SOFTWARE .....	319.95
MX/FX RIBBONS .....	7.95
	3/21/00

## MICRO MERCHANT

898 Via Lata • P.O. Box 1516 • Colton, CA 92324

**800-652-8391** ORDERS ONLY!

**714-824-5555** CA, AK, HI

(Customer Service, Order Status)

**TO ORDER:** Send Money Order or Cashiers Check, personal checks held 21 days. California residents add 6% sales tax, VISA or M/C add 3%. **SHIPPING:** UPS delivery add 3%, \$3.00 min. APO/FPO add 5%, \$5.00 min. Foreign orders add 10%, \$10.00 min.

Sorry no COD's or P.O.'s accepted. Prices subject to change without notice.

"I found the Apple Color Plotter to be a quiet, well-built machine."

in its standard selection of characters are ten punctuation marks that you can change into special symbols or accented letters. They help you write text in German, French, Swedish, Italian, Spanish, and British English, as well as in American English. There are also 14 special symbols available to use as data points when making a graph.

### Basic and Pascal

You can use a word processor to create a file of plotter commands. Since all the commands use ASCII characters, both Apple Writer and the Pascal Editor will work. You then send the file to the plotter, just as if it were a printer.

The instruction manual includes some sample programs in Basic and Pascal for practice in entering commands from the keyboard to control

the plotter. Beyond these samples, you have to write all your own software to plot anything. I have not found any commercial software that uses the Apple Color Plotter. However, I'm sure that won't be the case for long.

The manuals included with the plotter are also good for reference. They don't include a lot of programming examples, but have enough to get you started. They are well-written and contain a good index for finding things quickly. The only complaint I had was the confusing explanation of Viewports and Windows. I used up a good bit of paper learning about those commands.

Also included with the plotter are the eight different colored pens, the pen capper, a pack of 8½-by-11 and a pack of 11-by-17 paper, and a connecting cable for use with the Apple Super Serial Card. The paper is very

high quality and makes the best plots of any paper I tried.

I found the Apple Color Plotter to be a quiet, well-built machine with no operating "glitches." The accessories and documentation are good quality. The ability to plot on 11-by-17 paper or transparencies is unusual for a plotter in this price range. It is easy to interface with any computer with a serial interface that supports hardware handshaking. The major shortcoming is the lack of commercial software to run the machine. But, as I said, I don't think that will be the case for long. The Apple Color Plotter is available from your Apple dealer for \$799. ■

Lee E. Sumner  
Dallas, PA

Circle 141 on Reader Service card.

NEW  
FOR '84

# CRACKING TECHNIQUES

Share the secrets of the world's greatest crackers...

Axe Man, Bozo NYC, Candy Man, Cloneman, Disk Zapper, Lock Buster, Long John Silver, Jim Phelps, Mr. Krac-Man, Red Rebel, Trystan II, Reset Vector, The Woodpecker, Mr. Xerox...and many more!

Study complete tutorials on Boot Tracing, Software Tricks, Non-Maskable Interrupt, Ram

Card Modifications, Hardware Tricks and other tried and true techniques. Discover indispensable tips on over 40 specific programs for Apple users.

Customize your software to suit your own needs! Order your copy of CRACKING TECHNIQUES '84 today. Supplied on disk for Apple Computers.

For faster service, charge your order to MasterCard or VISA.

\$39.95

Call our toll free number and ask for Operator 68

1-800-824-7888

In California, call 1-800-852-7777

 **PIRATES HARBOR**

PIRATES HARBOR, INC.  
P.O. Box 8928, Boston, MA 02114

VOICE: (617) 227-7760 MODEM: (617) 720-3600

Apple is a registered trademark of Apple Computer, Inc.

YES, I want to learn the secrets of *Cracking Techniques '84*.

Enclosed is my check/money order for \$39.95 (Massachusetts residents add 5% sales tax).

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

PHONE: (\_\_\_\_\_) \_\_\_\_\_

 **PIRATES HARBOR**

PIRATES HARBOR, INC., P.O. Box 8928, Boston, MA 02114

IC-12

# Software Reviews

## Cut & Paste

After the success of its Pinball and Music Construction Sets, Electronic Arts has produced a Text Construction Set—Cut & Paste, a word processor that offers attractive simplicity, surprising power, and a bargain price (\$49.95). It's not the revolution in home software that EA's ads and packaging claim, but it's a strong contender in the sub-\$70 word processing wars.

Once you get past the 1,000 word essay on the package, which follows EA's advertising policy of colossal vanity—the members of its staff have the most brilliant minds in computing, Cut & Paste is the first truly usable word processor—there's the C&P program disk, a document disk, and a passable manual (it relies on or supplements the command summary card, instead of the other way around).

Booting the program disk loads C&P into memory; after that, all work, even copying or formatting new disks, can be done with a document disk in drive 1—a boon for single-drive Apple users. (If you have two drives, you can work with two document disks at once, toggling C&P's read and write functions from one to the other. This convenience makes up for the program's requiring its own, rather than DOS's, disk formatting.)

With a document disk loaded, pressing return calls one of Cut & Paste's two screen displays—a catalog of the disk's files (to start from scratch, you load the file named Blank). The bottom two lines of the screen are devoted to a command menu and accompanying prompts; to load a file, you use the arrow keys to select it from the catalog, press escape to enter the menu, and press return when the cursor's on the Load function.

Besides Load, the catalog menu lets you print, delete, or rename a file, copy or format a disk, switch to drive 2, end a C&P session, or configure the program to your system

(40- or 80-column display, 10 or 12 printer characters per inch, and so on).

C&P's other screen display is, of course, the text file you're working on, which scrolls between an identifying line at top and another command menu at bottom. Again, escape enters the menu and return executes the selected function, whether in the command menu or sub-menus: Save, for instance, brings a choice of saving the file under its current or a new name or aborting the process.

Cut & Paste is named for its primary editing feature. The program



is always in "insert mode," pushing text ahead of the cursor instead of writing over it, and the delete key is a destructive backspace. To delete forward or cut or move large blocks of text, control-A marks the start of a block, defined with the arrow keys in reverse video; the Cut function moves it from the screen into a buffer, and Paste inserts the buffer's contents or most recently cut text at the cursor.

Other menu options let you inspect or empty the buffer, or indent or unindent the left margin five spaces at a time (useful for outlines, though there's no centering, justification, or change in the right margin). There's no print preview feature as in Sierra On-Line's HomeWord, but you can save and select among three printing formats for different sizes of paper or kinds of files.

While Cut & Paste's menus make it easy enough for children or beginners, experienced users will appreciate its ability to take commands from the keyboard as well (to cut text, for example, control-C is a time-saving alternative to escape, three right arrows, and return). They'll also like being able to scroll one screen up or down or to the top or bottom of a file, though there's no quick way to move the cursor horizontally. Also, carriage returns are invisible, and thus easily overlooked or deleted accidentally.

Finally, experts will be slowed by C&P's bevy of prompts or error messages, but to users prone to quit without saving their latest versions ("You Haven't Saved Your Changes"), they're invaluable.

Cut & Paste is a little harder to learn than Bank Street Writer, but considerably easier to use (it avoids BSW's clumsy switching between writing and editing modes, and has a full 80-column display besides). Like other economical word processors, it's simple enough for small jobs or home use; unlike many, it's almost as powerful as a big program for "real" work. I don't like the package, but I like the program.

It's available from Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. ■

Eric Grevstad  
Peterborough, NH

## I.Q. Baseball

With all due respect to the rabid Yankee and Red Sox fans in my own family, Chicago Cubs and White Sox fans are the greatest in the world. They always enjoy the game, win or lose. Only Chicagoans, with their great love of the game, could have created a baseball trivia game as much fun as I.Q. Baseball.

I.Q. Baseball really challenges your baseball knowledge; it's no game for the casual, seasonal fan. To win at this game you have to think baseball 365 days a year, which is of

itself a healthy and worthwhile thing to do.

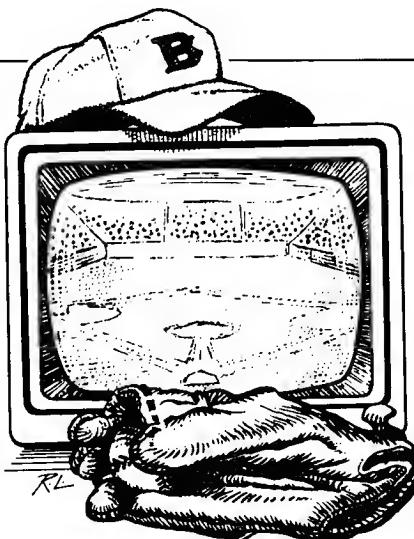
The format of the quiz is a baseball game, depicted in high-resolution color graphics. Besides the sights of the game, there are also the sounds of the ballpark: the roar of the crowd, the stadium organ and one of the best voice simulations I've encountered in a computer game. Other realistic touches include cheering for home team home runs, "rally" and "charge" music when your runners are on base, rain delays (and rainouts!) and, in the true Chicago White Sox tradition, the playing of "Na-na-hey-hey Goodbye!" when a pitcher is yanked from the game.

Before the game begins the player must choose between solitaire (human/computer) and two-player action and between "Minor League" and "Major League" questions. Having accomplished that, there's a brief pause for the National Anthem, the shout of "Play ball!" and at last the game begins.

Once the animated batter steps up to the plate the pitcher hurls the ball and, in the text window below the graphic, a multiple choice question is displayed. In the solitaire mode, with the computer batting, your choice of a correct answer results in an automatic out. In the instance of an incorrect answer, the computer usually awards itself a hit; frequently a double, triple or a home run.

The human player will find, during his at-bats for the home team, that the job of scoring runs is fairly difficult. From time to time during your "ups," the ball you hit with your right answer will be fielded by the third baseman for one out and you will be left with the curiously unconsoling message, "Oh no! You was robbed!" If there are runners on base, it's likely that there will be a double or triple play. I saw more triple plays in this game in one afternoon than in 25 years of watching live baseball. The point is, in order to score runs you have to be very, very consistently correct in answering the "Question Ball."

The questions are not all out of the range of the average fan, to be sure.



Almost anyone can pick the name of the man who hit the most home runs in a 162 game season (Roger Maris, 1961), or the name of the first expansion team to win a World Series (the 1969 N.Y. Mets, God bless 'em). Now try these questions from the "Minor League" list on for size:

- What player-manager led the Indians to the '48 championship?
- Who was the only pitcher to appear in more than 1,000 games?
- Who pitched a 12-inning perfect game but lost in the 13th inning?
- Who was the player Seattle fans nicknamed "The Inspector?"
- What player won the MVP for two years running?

No, the answers are *not* on page 89. As Casey Stengel used to say, you could look 'em up. I strongly suggest that you do so before you play I.Q. Baseball, and most especially before you attack the much more difficult queries from the "Major League" list. Playing with that list you will find the "Visitors" hitting more home runs and your side hitting into more double plays. You have to be super-consistently correct to win the advanced game.

The questions seem to have a mid-western orientation to them, focusing on the exploits and lore of the Cubs, White Sox, Twins, Brewers and Reds. For those with their own regional bias, there are supplementary question disks for each of the 26 major league teams and a special World Series question disk. Now you'll be able to find out just how much you

really know about that favorite team of yours.

I.Q. Baseball is not the slickest game I've seen in terms of graphics. The graphic design and animation are adequate for the job but uninspired. This one consideration aside, the game plays well. I.Q. Baseball is great entertainment and engrossing fun for anyone who really enjoys baseball. Even if you don't aspire to baseball expertise now, a few games with I.Q. Baseball could easily make an expert out of you—or at least give you enough ammunition to prevail in a few taproom controversies.

I.Q. Baseball is manufactured by Davka Corporation, 845 North Michigan Ave., Chicago IL 60611. The game disk costs \$24.95. The individual team disks and the World Series disk each cost \$14.95. The game requires an Apple II with Applesoft and 48K or an Apple IIe.

Brian J. Murphy  
Fairfield, CT

## Cubit

**C**ubit is a look-alike for Q-Bert. Originality is not this game's long suit. What is important is that the game provides a lively and light-hearted arcade challenge.

Assuming for a moment that you haven't seen Q-Bert or Cubit before, let me introduce you to the hero of this look-alike. He's only a few pixels high on your high-res color video screen, perfectly round with two stubby legs, a hooked nose, and a marked tendency to cuss a streak, in cartoonese "#:\$&!!," when he's tripped up in his quest to change the color of the pyramid.

Ah, yes—the pyramid. This is probably the only example of winning a game by climbing down the pyramid—and up again, and sideways, and down. The pyramid is made of cubes with three sides showing. Your job, using joystick or keyboard commands, is to maneuver Cubit onto the top face of these blocks, changing their color. When Cubit has changed all the blocks to

the target color, then the game progresses to the next level. The game is divided into four levels of difficulty, with each level divided into four rounds.

The game sounds simple at first, but there are a few surprises in store for our hero Cubit as he bounds up and down the pyramid. One such surprise is the rocks that roll down

the pyramid. In the easier levels, the rocks roll from one cube to the next with stately slowness. You should have no difficulty helping Cubit dodge them. In the higher rounds and levels, the rocks increase in number and move faster. Sometimes as a rock reaches the bottom of the pyramid, it will metamorphose into a snake that vigorously pursues the little

hero all over the pyramid. Escape may be difficult, especially when you're at a level where the squares you haven't landed on yet are invisible.

Among Cubit's worst enemies are the Gremlins. These little guys horn in on Cubit's act by hopping on the cubes Cubit already landed on and change their color again. This makes life hard for Cubit, especially when he's on a level where he has to land on a cube face more than once to change its color. It's a good thing that Cubit can kill off these creatures merely by touching them.

Cubit's best friends are the stars and the disks. The disks are spinning objects that hover just beyond the pyramid. If Cubit jumps onto one, the disk will take him back to the top of the pyramid. The disk provides not only an ideal escape route from a snake, but a possible death trap for the snake, since it may follow Cubit off the structure. Unfortunately for the snake, it can never touch the disk. Instead, the snake will fall to its death.

The stars help out when Cubit touches them by temporarily freezing all the rocks, snakes, and Gremlins, giving Cubit the chance to finish re-coloring the pyramid.

Cubit is good fun for youngsters and adults alike. The graphics are good, but not great, and the sound effects are appropriate and adequate. The important thing is play value, and in that respect, Cubit is a winner. This is the way to go if you want to recreate Q-Bert with your Apple.

Cubit can leap into your arms from the corporate pyramid of Micromax, 6868 Nancy Ridge Drive, San Diego, CA 92121. It's designed for use with 48K Apple IIs and with the IIe. Price is \$39.95. ■

Brian J. Murphy  
Fairfield, CT

### Don't Throw Away Your Apple I / Ie\* 80 Column Text Card! Transform It Into The "Extended 64K Version"



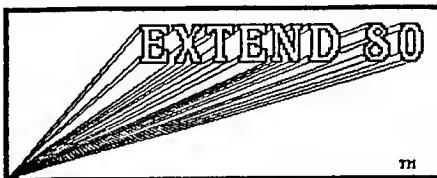
If you are not satisfied  
you may return within  
ten days for a Full  
Refund.  
(Shipping not included)

#### ONE YEAR WARRANTY

- ✓ Extend 80 plugs into your standard 80 column card to make your Apple I / Ie\* a 128K system.
- ✓ Extend 80 offers Total Compatibility.
- ✓ Extend 80 is a quality, thoroughly tested product.
- ✓ Extend 80 sells for just \$129.95 +

\*Apple I / Ie is a trademark of Apple Computer, Inc.

+ Add \$3.00 for shipping (\$10.00 outside the U.S.  
— Payment in U.S. dollars only)



— DEALER/INQUIRIES WELCOME —

I want Extend 80 for just \$129.95 +

Mastercard  Visa  Check, M.O.  
(FL residents add 5% sales tax)

Name \_\_\_\_\_ Tel. # \_\_\_\_\_

Address \_\_\_\_\_

(ALLOW 10 DAYS FOR  
PERSONAL CHECKS)

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

If you prefer ask  
your Local Dealer  
to order Extend  
80 for you.

Charge Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

MANUFACTURER: CARIBBEAN COMPUTER SALES, INC.  
221 EAST OSCEOLA - SUITE 110  
STUART, FL 33494 (305) 287-3336

## OPVAL

Since listed stock options began trading in 1973, they have been one of the fastest growing forms of investment. Leverage, or the ability to



No Hidden Charges  
No Charge for Credit Cards  
No Shipping Delay for Personal Checks

**SAVE!**

**ATARISOFT**

Centipede ..... \$28.00  
Defender ..... \$28.00  
Pac-Man ..... \$28.00  
Robotron 2084 ..... 28.00

**AVALON HILL**

T.A.C. ..... \$28.00  
Telengard ..... 28.00

**AVANT-GARDE CREATIONS**

Computer Golf 2 ..... \$25.00

**BEAGLE BROTHERS**

Alpha Plot ..... \$28.00  
Apple Mechanic ..... 21.00  
Beagle Bag ..... 21.00  
Beagle Basic ..... 28.00  
DOS Boss ..... 20.00  
Double Take ..... 25.00  
Flex Text/Type ..... 21.00  
Frame Up ..... 21.00  
Pronto DOS ..... 21.00  
Tip Disk #1 ..... 15.00  
Typefaces ..... 15.00  
Utility City ..... 21.00

**BLUE CHIP**

Beron ..... \$42.00  
Millionaire ..... 42.00  
Tycoon ..... 42.00

**BRODERBUND**

A.E. ..... \$25.00  
Bank Street Writer ..... 48.00  
Choplifter ..... 25.00  
Drol ..... 25.00  
Gumbell ..... 21.00  
Lode Runner ..... 25.00  
Spare Change ..... 25.00

**CALIFORNIA PACIFIC**

Ultima/Akabéth ..... \$25.00

**CBS SOFTWARE**

Goren: Learning Bridge  
Made Easy ..... \$56.00  
Mastering the SAT ..... 105.00  
Mystery Master ..... 25.00  
Success With Math ..... ea. 20.00

**DATAMOST**

Aztec ..... \$28.00  
Blestoed ..... 28.00  
Casino ..... 28.00  
Swashbuckler ..... 25.00  
Theif ..... 21.00

**DATASOFT**

Zaxxon ..... \$28.00

**DECISION SUPPORT**

The Accountant ..... \$99.00  
Business Accountant ..... 225.00

**DESIGN-WARE**

Creature Creator ..... \$28.00  
Crypto-Cube ..... 28.00  
Spellicopter ..... 28.00  
Trep-A-Zoid ..... 28.00

**EDU-WARE**

Algebra 1-4 ..... ea \$28.00  
Algebra 5 & 8 ..... 35.00  
Compu-Reed ..... 21.00  
Decimals ..... 35.00  
Fractions ..... 35.00  
Prisoner 2 ..... 25.00  
Rendezvous ..... 28.00

**EINSTEIN**

Einstein Compiler ..... \$99.00  
Memory Trainer ..... 68.00

**DOW JONES & CO.**

Dow Jones  
Connector ..... \$ 40.00  
Investment  
Evaluator ..... 110.00  
Market  
Analyzer ..... 275.00  
Market Manager ..... 235.00  
Market  
Microscope ..... 559.00

**H.A.L. LABS**

Super Taxman 2 ..... \$20.00  
Vindictor ..... 20.00

**HAYDEN SOFTWARE**

Go ..... \$25.00  
MicroMath ..... ea. 21.00  
ORCA/M ..... .99.00  
Pie Writer 2.2 ..... 112.00  
Sargon III ..... 35.00

**HOWARD SOFTWARE**

Tax Preparer 1983 ..... \$169.00  
Tax Preparer 1984 ..... CALL

**INFOCOM**

Deadline ..... \$35.00  
Enchanter ..... 35.00  
Infidel ..... 35.00  
Planettall ..... 35.00  
Starcross ..... 28.00  
Suspended ..... 35.00  
Witness ..... 35.00  
Zork I, II, III ..... ea. 28.00

**KOALA TECHNOLOGIES**

Koala Touch Tablet ..... \$89.00  
Coloring Book ..... 21.99  
Spider Eater ..... 21.00

**KRELL SOFTWARE**

Krell Logo ..... \$75.00  
Krell SAT ..... 249.00

**L & S COMPUTERWARE**

Crossword Magic ..... \$35.00

**LIGHTNING SOFTWARE**

Master Type ..... \$28.00

**MICROLAB**

Death in Caribbean ..... \$25.00  
Dino Eggs ..... 28.00  
Miner 2049er ..... 28.00

**MICROMAX**

Cubit ..... \$28.00  
(Call for pricing on  
MICROMAX hardware)

**MICROSOFT**

MultiPlen ..... \$175.00  
Olympic Decathlon ..... 21.00  
Typing Tutor II ..... 20.00

**MONOGRAM**

Dollars & Sensa ..... \$79.00

**MUSE**

Advanced Blackjack ..... \$35.00  
Castle Wolfenstein ..... 21.00  
Caverns of Freitag ..... 21.00  
Eating Machine ..... 35.00  
Robot Wer ..... 28.00  
Super Text ..... 79.00

**ODESTA**

Chess 7.0 ..... \$49.00  
Checkers ..... 35.00  
Odin ..... 35.00

**OMEGA MICROWARE**

Chet Trader + ..... \$149.00  
Inspector ..... 45.00  
Locksmith 5.0 ..... 75.00  
Watson ..... 35.00

**ORIGIN SYSTEMS**

Exodus: Ultima III ..... \$40.00

**HARDWARE**

**JOYSTICKS AND PADDLES**

Hayes Joysticks ..... CALL  
Kraft Joystick ..... 40.00  
Kraft Paddles ..... 35.00

**MODEMS**

Apple Cat II ..... \$295.00  
Apple Cat 212 ..... 580.00  
Micromodem II ..... \$259.00  
(Works with all Apples)

**PRINTER INTERFACES**

Grappler + ..... \$125.00  
Grappler/16K  
buffer ..... 199.00

Orange Interface ..... 75.00

**80 COLUMN CARDS**

Ultraterm ..... \$279.00  
Videoterm ..... CALL

**BLANK DISKS (box of 10)**

Elephant SS/SD ..... \$22.00  
Elephant SS/DD ..... 25.00  
Maxell SS/DD ..... 30.00  
Verbatim SS/DD ..... 28.00

Disk File Box  
(holds 60) ..... 20.00

**MISCELLANEOUS HARDWARE**

Alaske Card ..... \$99.00  
Microsoft  
Softcard ..... 225.00  
System Saver ..... 65.00

**SILICON VALLEY SYSTEMS**

Word Handler ..... \$45.00  
List Handler ..... 40.00  
Spell Handler ..... 45.00  
The Handlers Pkg. ..... 99.00

**SIR-TECH**

Wizerdry ..... \$35.00  
Knight of Diamonds ..... 25.00  
Legacy of Llylgarny ..... 28.00  
Wizprint ..... 20.00

**STONWARE**

DB Master V.4 ..... \$279.00

**SUB-LOGIC**

Flight Simulator II ..... \$35.00  
Night Mission Pinball ..... 21.00  
Saturn Navigator ..... 25.00  
Space Vikings ..... 35.00

**UTILICO SOFTWARE**

Essentiel Date  
Duplicator ..... \$60.00

**ULTRASOFT**

Mask of the Sun ..... \$28.00  
Serpent's Star ..... 28.00

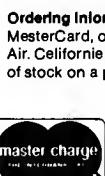
**VISICORP**

VisiCalc ..... \$175.00  
VisiCalc II ..... 175.00  
VisiCalc Adv. II ..... 220.00  
VisiFile ..... 175.00

**XEROX EDUCATION**

Chivalry ..... \$35.00  
Fat City ..... 28.00  
Old Ironsides ..... 28.00  
Stickybeer ABC ..... 28.00  
Basketbounce ..... 28.00  
Bop ..... 28.00  
Numbers ..... 28.00  
Opposites ..... 28.00  
Shapes ..... 28.00

**RISING SUN SOFTWARE**  
4200 PARK BLVD.  
OAKLAND, CALIFORNIA 94602  
(415) 482-3391



CALL TOLL FREE  
800-321-7770 (outside California)  
800-321-7771 (inside California)



# Join the one computer club that means business—

## THE PRENTICE-HALL personal computer BOOK CLUB

Circle 187 on Reader Service card.

Now, specifically for business and professional people -- The Prentice-Hall Personal Computer Book Club. Join today and quickly develop sharp computer skills. Find out about software that fills your needs. Keep up with advances in hardware, software, and peripherals.

**Special Introductory Offer:**  
**Free Trial / Free Gift / No Obligation**

**FREE TRIAL:** You get the Basic Personal Computer Library (an \$80.80 value) for only \$2.95. It covers the most important personal computer topics in four handy volumes:

- Developing Computer Solutions to Your Business Problems
- Getting the Most Out of Your Word Processor
- How to Find and Buy Good Software
- The Visicalc Applications Book

The titles are self-explanatory. The quality and content -- only you can judge. So try them all, FREE, for 15 days. If the Basic Library meets your standards, keep it for only \$2.95. Otherwise, send it back and your membership will be cancelled, no questions asked.

**FREE GIFT:** Just for examining the Basic Library, you get a FREE copy of "The Electronic Office" (list \$12.95), an informative guide to office automation. It is yours to keep, no charge, even if you return the Basic Library.

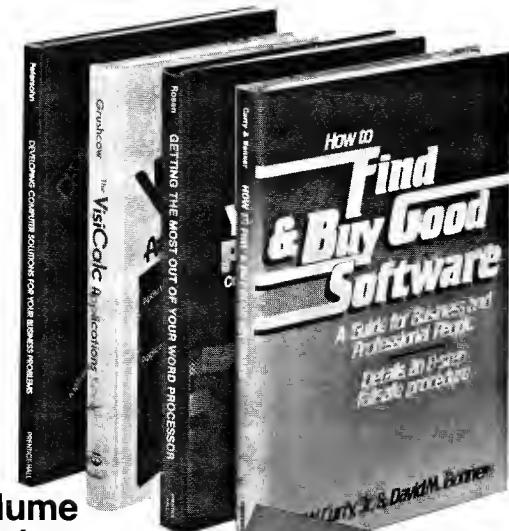
**NO OBLIGATION:** There are no minimum purchase requirements for members. If PCBC selections aren't what you want, you won't have to buy even one.

### How the Club Works

Every four weeks, you will receive the club bulletin, offering the finest computer books from Prentice-Hall and other publishers. Each bulletin will feature a Main Selection and at least 50 Alternates, often including software.

If you want the Main Selection, do nothing (it will be sent automatically). If you want an Alternate, or no book at all, indicate your preference on the card that comes with the bulletin and send it back.

You will have at least 10 days to decide. If you receive an unwanted selection because you did not have 10 days, return it at club expense. All PCBC selections are first-quality publishers' editions, discounted up to 35%. (A postage and handling charge, plus applicable sales tax, is added to all shipments.) Qualified members may also participate in special savings programs.



**Take the 4-volume  
Basic Personal  
Computer Library  
an \$80.80 retail value  
for only \$295**

plus postage  
and handling

with membership in the Prentice-Hall  
Personal Computer Book Club

**PLUS a 5th  
Book FREE**



**The Prentice-Hall Personal Computer Book Club**  
Membership Enrollment Center  
Post Office Box 42 West Nyack, NY 10995

### FREE GIFT/FREE EXAMINATION COUPON

YES. Please enroll me as a trial member, and rush me the 4-volume Basic Personal Computer Library. Bill me only \$2.95, plus local tax, postage and handling. Also rush me my FREE Gift Volume, *The Electronic Office* (a \$12.95 value).

I understand that I am under no obligation to purchase more books and that I may cancel my membership any time after I've paid for the selections I've chosen.

Signature \_\_\_\_\_

I presently have access to the following machines:

IBM PC  Apple  TRS 80  None

Other: \_\_\_\_\_

Name \_\_\_\_\_  
Please print \_\_\_\_\_

Address \_\_\_\_\_ Apt. \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Offer valid in Continental U.S.A. only. Enrollment is subject to acceptance by the Prentice-Hall Personal Computer Book Club

control large amounts of stock with little capital, lure people to options.

OPVAL is a stock option analysis program by Bob Emmons of Calcshop Inc., West Caldwell, NJ. It analyzes option strategies and indicates when the profit potential is statistically in your favor.

OPVAL is designed to display information just like the pages of a book. The program boots up to a table of contents, showing page titles and abbreviations in logical clusters such as calls, puts, and graphs. To go from one page to another, simply type the two-letter page code in the space provided and press return. Almost the entire program is loaded into memory after booting, so there is little waiting for disks to spin while performing analysis.

Enter basic information into the program before starting your analysis. You must go to the Date and Rate page to enter the current date and prevailing interest rate on short term Treasury Bills. Afterward, the auto calendar displays the option expirations for the next 12 months, and the number of days remaining. You need not count the days to expiration. The date and interest rate are needed for the option valuation model, as you will see.

Next, go to the Stock Data page and load stock information from your data disk, or type in the price, dividend, volatility, and option cycle of an issue not already on file. OPVAL saves stock and option prices, positions, graphs, and other information to disk for future use. You don't have to input this information every time you analyze the same stock, but you must in order to update current prices.

Like other option analysis programs, OPVAL calculates the fair price or theoretical value of an option using the Black-Scholes model, which is a widely-accepted formula within the investment community. The model's key ingredient is a stock's volatility—a percentage of how much a stock went up or down in a fixed period. Current interest rates and dividends are also needed. The Black-Scholes model also determines

what an option should sell for relative to the underlying stock price until the contract expires.

The theoretical prices are then compared with actual option prices to determine if they are over- or under-valued. Chances for profit are best when you purchase under-valued options and sell over-valued options. This is the key to stock option evaluation programs.

The main difference between OPVAL and other stock option analysis programs is the emphasis on *market implied volatility*. This calculates the current market prices of options instead of historical stock prices. It actually uses the Black-Scholes model in reverse. You supply the actual option prices, and the program figures out the volatility. In OPVAL, implied volatility is the market's outlook for the future, which is more important than the past when evaluating option prices. Other option programs use a stock's historical volatility to calculate theoretical prices.

OPVAL relies on implied volatilities in the Black-Scholes model. They are obtained after inputting the market prices of your options. Since the implied volatilities of each option will probably differ, the manual suggests disregarding those far from the norm and using an average of the remaining volatilities. Once a volatility is determined, it can be entered into the stock data page for temporary analysis or saved to disk to update your files.

Once you have theoretical values, the corresponding deltas (hedge ratios) are calculated. Deltas are the amount an option's price changes with each \$1.00 increase in the underlying stock. Options do not move dollar for dollar with the stock until the stock price is above the call's strike price or below the put's strike price. OPVAL will calculate deltas for a single option or a complicated position.

A nice feature of OPVAL is that all options pages resemble the *Wall Street Journal*—horizontal by month, vertical by strike price. Also, the expiration date is shown as well as the month, in inverse video.

# APPLE SOFTWARE SPECIALS!

\$1.00 credit for phone orders over \$100.00

## EDUCATIONAL (OUR SPECIALTY)

### MATH

	LIST	SPECIAL
Algebra Arcade . . . . .	49.95	35.96
CBS Add/Sub . . . . .	24.95	17.96
Dragon Mix . . . . .	34.00	24.16
Factor Blast . . . . .	34.95	24.86
Fraction Fever . . . . .	34.95	24.86
Quadrilaterals . . . . .	34.95	24.86

### ENGLISH

Alphabet Zoo . . . . .	29.95	21.66
Homeword . . . . .	69.95	49.76
Reader Rabbit . . . . .	39.95	28.56
Speed Reader II . . . . .	69.95	49.76
Spellicopter . . . . .	39.95	28.56
Wizard of Words . . . . .	39.95	28.56

### OTHER

Astro Quotes . . . . .	23.95	17.22
Game of States . . . . .	39.95	28.56
Gertrude's Secrets . . . . .	44.95	32.26
Go to Head of Class . . . . .	39.95	28.56
Goren Bridge Tutor . . . . .	79.95	57.16
S'Bear Opposites . . . . .	39.95	28.56
SAT (Barrons) . . . . .	79.95	57.16
SAT (Krell) . . . . .	299.95	252.96
Think Tank . . . . .	150.00	108.96
Trains . . . . .	39.95	28.56

## Ask for FREE price list

Educators: ask for special educational catalog

### HARDWARE

Koala Pad . . . . .	124.95	90.46
Kraft Joystick . . . . .	49.95	35.96
RH Fan w/Zener Ray . . . . .	109.00	78.66
Replay II - (Ile) . . . . .	80.00	55.00
Wildcard 2 . . . . .	139.95	110.19
Wildcard + . . . . .	169.95	133.56

### MISCELLANEOUS

Crypt of Medea . . . . .	34.95	24.86
D.B. Master 4.0 . . . . .	350.00	255.00
Deadline . . . . .	49.95	35.96
Donkey Kong . . . . .	34.95	28.76
Ess. Data Dup (EDD) . . . . .	79.95	58.16
Flight Sim II . . . . .	49.95	38.96
GPLE . . . . .	49.95	35.96
Graphics Dept. . . . .	124.95	90.46
Locksmith 5.0 . . . . .	99.95	77.96
Micro Cookbook (II + or Ile) . . . . .	40.00	28.56
North Atlantic '86 . . . . .	59.95	43.36
Oil's Well . . . . .	34.95	24.86
PFS File or Rept. (II + or Ile) . . . . .	125.00	90.46
Pro Tour Golf . . . . .	39.95	28.56
Ringside Seat . . . . .	39.95	28.56
Robotron: 2084 . . . . .	34.95	28.76
Sargon III . . . . .	49.95	35.96
Sensible Speller . . . . .	124.95	90.46
Spare Change . . . . .	34.95	24.86
The Handlers . . . . .	129.95	94.16
Wizardry . . . . .	49.95	35.96



Apple is a trademark of Apple Computer, Inc.

C.O.O. • M.O. • Cert. Checks • School P.O.

• VISA • MasterCard • Checks Allow 2 Weeks

• N.Y.S. Res. Add Sales Tax • US Orders

Under \$150. Add \$2.00 P & H • All Canadian,

US Funds \$3.00 P & H • Foreign, Charges Only,

Min. P & H \$7.00

Box 525, Dept. J  
East Setauket, N.Y. 11733  
(516) 751-2535

OPVAL analyzes simple calls, puts, or complicated strategies involving any combination of stock and up to 96 options (48 calls, 48 puts) in 18 seconds. Any page of calculations can be shown in either fractions or decimals. Control-F allows you to shift back and forth to your preference.

The page for entering your option positions is also in newspaper format for standardized screen pages. Simply move the cursor to the appropriate strike price and type in the number of contracts that you are long. For contracts that you are short, type a minus sign before the number on separate pages for calls and puts. Stock positions (in 100 shares) can be entered at the bottom of the page. There is no need to name a position such as spread or straddle. Just enter the amount of contracts or stock involved, and OPVAL will analyze it whether the position has a name

or not.

Once a position is entered, you can generate two types of graphs with complete control of both the horizontal and vertical scales. One graph helps you visualize leverage by showing price changes in the underlying stock on an option position. The other graph shows the effect of time on an option position. Options are wasting assets, so if the stock doesn't reach the breakeven point (considering the premium paid for the contract) plus commissions, it becomes worthless. The graphs seem complicated at first, but once you master them they help visualize "what if" scenarios. You can change the "current date" on the Date and Rate page to illustrate "what if" sequences.

Control-P prints any OPVAL screen page. Graphics can be printed without a special interface card because they are programmed in the

text mode instead of hi-res. The program uses asterisks as graph data points, but are a little difficult to interpret because of the distance between them.

OPVAL has two Dow Jones interfaces. One logs on to access stock and option quotes for one or two issues that you might be evaluating. The other interface automatically retrieves stock and option quotes on a list of up to 80 securities in your data base. Prices can also be entered manually.

OPVAL is a good option analysis program that's easy to use for simple or advanced strategies. It is also used with index options, convertibles, and warrants.

A future revision should include a few changes. It would be nice if the program calculated historical volatility. After all, the definition of technical analysis is the study of past trends

Circle 108 on Reader Service card.

## DIVERSI-DOS IS THE BEST

### \*\*\* NEW \*\*\* NEW \*\*\* NEW \*\*\*

**TLIST** — Lists BASIC files without destroying the program in memory. Use TLIST to copy lines from one program to another / Improved list format without indents, for easier editing / Visible control characters / Also lists program in memory with improved format

**Insert/Delete Mode** — Makes program editing a pleasure! Insert characters in the middle of a line without re-typing. Also works for data entry!

**Keyboard MACROS** — Enter whole phrases with a single keystroke! Make your own custom editing keys, or redefine your entire keyboard (Dvorak keyboard included)

**Wildcard file names** — Enter only the first few letters of a file name (searches the directory for a match)

**BSAVE** — "A" and "L" parameters are not necessary (uses "A" and "L" from last BLOAD)

Recognizable ESCAPE and INSERT mode cursors

Lowercase DOS commands accepted

Catalog abort key

Lists text files to screen or printer

"Of all the DOS enhancement packages reviewed in Peeling II to date, DIVERSI-DOS is the most powerful in terms of its capabilities coupled with its price. DIVERSI-DOS is the only product to speed up all areas of DOS—LOAD/BLOAD, RUN/BRUN, SAVE/BSAVE, as well as the READ and WRITE of text files...The documentation is superb. (Rating AA)"  
— Peeling II Magazine

### WHAT ARE YOU WAITING FOR???

Are you tired of waiting for DOS to load and save files? Are you tired of waiting for DOS to finish so you can type again? Are you tired of waiting for your printer? When you buy **DIVERSI-DOS**™, by Bill Basham, you won't have to wait any more! Here's why:

1. DOS speed-up: Apple DOS 3.3 takes 18 disk revolutions to read a single track, whereas **DIVERSI-DOS** reads or writes a track in just 2 revolutions. This speeds up file processing tremendously (see table).

2. Keyboard Buffer: **DIVERSI-DOS** allows you to type ahead, as fast as you can, without missing a single character.

3. Print Buffer: **DIVERSI-DOS** can use a RAM card (16K-128K) to temporarily save characters before they are printed. Thus, your computer won't have to wait for your printer to finish.

4. DDMOVER: **DIVERSI-DOS** can now be moved to a RAM card to increase the available memory in a BASIC program.

**DIVERSI-DOS**, the QUADRUPLE utility, requires a 48K Apple II, II+ or //e with DOS 3.3. A simple, menu-driven installation program is included on the un-protected disk. So what are you waiting for?

#### APPLE DOS      DIVERSI-DOS

SAVE†	27.1 sec.	5.9 sec.
LOAD‡	19.2 sec.	4.5 sec.
BSAVE*	13.6 sec.	4.1 sec.
BLOAD*	9.5 sec.	2.6 sec.
READ**	42.2 sec.	12.4 sec.
WRITE**	44.6 sec.	14.9 sec.
APPEND**	21.3 sec.	2.3 sec.

\*Hi-res screen † 80-sector BASIC program

\*\* 52-sector text file

### ORDER TOLL-FREE

Call NOW: 800 835-2246 ext. 127 (orders only)  
For information, call 815 877-1343  
Disks normally shipped within 24 hours.  
Only \$30: Includes 1st class or foreign airmail.  
Sold by mail order only.  
Return in 30 days for full refund, if not totally satisfied!

**FREE** — with your order — **FREE**  
**DOGFIGHT® II** — By Bill Basham  
— A special mail-order version of the arcade game for 1 to 8 players, recently listed #6 on the best seller list!

Send \$30 (U.S. funds) to:  
Diversified Software Research, Inc.  
5848 Crampton Court  
Rockford, Illinois 61111



Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Visa/Mastercard, C.O.D. or personal check accepted.

Card #: \_\_\_\_\_

Exp. Date: \_\_\_\_\_

## Stock Option Software Takes Just 18 Seconds To Evaluate 96 Options

### FREE BROCHURE

for Investors Using Apple Computers™

to predict future pricing behavior. Also, I find the process of determining implied volatility cumbersome. Weekly closing prices could be entered into the stock data base for updated historical volatilities. The Dow Jones interface could make this an easy task. Both historical and market implied volatility have their application, but the program user should have the choice.

The inclusion of commissions in position analysis would help, because they can add up in multiple option strategies. I'd also like to see a tabular graphs readout and the ticker symbol of the analyzed underlying stock shown on all screen pages. I find myself labeling graphs printed for future reference, especially when dealing with more than one stock.

The program works on an Apple II, IIe (40-column mode) and III (emulation mode). It can work with

**OpVal** includes newspaper-like tabular displays for forecasted prices (adjusted Black-Scholes), quoted prices, expected profit and other option information; recall of ALL security information; market quotes from Dow Jones™ or keyboard auto-calendar to Dec., 2060; strategy and position graphs; forecast volatility; electronic book design that makes menu mazes obsolete. For Apple Computers™. Program and manual \$250. Demo disk and manual \$35 (credit on purchase of program). Tax deductible for investors.

**Phone or write now! No obligation.**

### FREE STOCK OPTION SOFTWARE BROCHURE FOR:

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

**S CalcShop Inc.**, Box 1231-C  
W. Caldwell, NJ 07007  
**Telephone: (201) 228-9139**

\*\*Apple Computer Inc. Trademark

\*\*Dow Jones & Co. Inc. Trademark

## MAIL MANAGER™ A NEW PROFESSIONAL STANDARD

The ONE Mailing List/File Management Program that creates Mail Merge files for all versions of

APPLEWRITER II SCREENWRITER II  
EXECUTIVE SECRETARY MAGIC WINDOW II

and for its own, Built-In, Word Processor.

- ✓ 9999 record capacity ✓ defaults on entry
- ✓ specify field names & lengths or use default
- ✓ instant search over any combination of fields
- ✓ sort by name, zip code or any other field
- ✓ print labels in 1 to 4 columns, also envelopes, lists, invoices (does math) and forms
- ✓ user-defined print formats stored on disk
- ✓ text insertion anywhere in output (e.g., Att: Occupant, Sales Director, Please Forward)
- ✓ duplication identification ✓ mass change & delete
- ✓ restructure file at any time without retyping data
- ✓ create subfiles and DIF files ✓ merge files
- ✓ screen prompts for commands ✓ easy to learn
- ✓ extensively field tested ✓ detailed manual
- ✓ Free guide to Data Base Management
- ✓ 24 hour user support number
- Apple II+ or IIe, Franklin, etc., 48K, min. 1 disk drive

**Still Only \$89.95**

Credit Card Orders • 24-Hour • Toll-Free

800-227-1617 ext. 258

800-772-3545 ext. 258 in CA



or send a check today to:

**Craftsbury Software**  
1623 Montague St., N.W. Dept. I  
Washington, D.C. 20011

Write for catalog or call (202) 829-3121

**MEMORY JOGGER**, a unique appointment calendar and time management system that is the perfect complement to MAIL MANAGER. Features a calendar calibrated for the next 100 years, one-time entry of recurring events, project scheduler, and auto day-of-the-week function. \$39.95. Both programs for \$99.

## New DAVID-DOS II™ Compared With Other DOS's

### Now you can speedup Text-file handling two ways

DAVID-DOS II is a new edition of DAVID-DOS with added speed, commands, and features. New Read, Write and Save routines are high speed. DAVID-DOS II updates full disks like Apple's Master Create. (The programs on your disks are not touched). DAVID-DOS II Initials blank disks with Basic, Binary or Exec HELLO in seconds. Ten new commands operate identical to existing DOS commands. Use them from the keyboard or in Basic programs. They accept A & L parameters.

#### Ten New DOS Commands

1. TLOAD speed loads all Text Files, random or sequential, to ram.
2. TSAVE speed saves all Text Files, random or sequential, from ram.
3. TLIST Lists all Text Files, random or sequential to screen/printer.
4. DUMP Memory to screen/printer in Hex with Ascii on right side.
5. DISA disassembles Binary to screen or printer.
6. AL prints last loaded program Address & Length in decimal & hex.
7. HIDOS moves DOS to Language Card & continues operation of program.
8. / is a one keystroke Catalog in addition to the original command.
9. DATE prints with any clock. Also File Dating with clock or manual.
10. FIND prints address's of hex found in 64k memory. Hidos cmd only.

#### Compatible

All DOS entry addresses have been preserved. DOS is original length and compatible with most software. David-Dos II is copyable and creates fully copyable updated disks. DAVID-DOS II is licensed by programmers for inclusion in the software they sell. Init areas were used for David-Dos II. Works with all Apple IIs including IIe 80 Col, Franklin & Hard Disks, such as Corvus & Xebec. Requires 48K. Complete documentation for screen or printing and many utilities are on the disk.

All times in seconds. (Time Test programs available)	DAVID DDS-II	ProDOS	OIVERSI DDS	DOS 3.3
TEXTFILES (100 Sectors) (791 Strings, 32 chars ea)	TSAVE TLOAD WRITE READ PRINT/READ (442 Sectors, 7 x 500)	8.0 6.2 29.3 24.3 44.2 142.3	NO NO 28.0 16.3 45.9 142.9	NO NO 29.4 24.3 45.1 117.1 1231.2
APPLESOFT (100 Sectors)	*SAVE LOAD	7.1 5.0	16.4 4.0	6.4 5.0 33.1 23.5
INTEGER (100 Sectors)	*SAVE LOAD	7.3 4.9	NO ND	6.6 4.9 33.4 23.4
BINARY (100 Sectors)	*BSAVE BLOAD	7.8 5.8	18.4 4.8	7.3 5.8 28.7 24.5
48K PROGRAM SPACE (With 3 Bufs avail)	APPLESOFT INTEGER BINARY	36,352 36,352 36,352	NO NO 34,816	36,352 36,352 36,352
64K PROGRAM SPACE (With 5 Bufs avail)	APPLESOFT INTEGER BINARY	46,592 46,592 46,592	31,232 NO 40,704	45,658 35,162 45,658 35,162
NUMBER OF DDS COMMANDS CLOCK FILE DATING MANUAL FILE DATING ONE KEYSTROKE CATALOG AUTO USE INTEGER CARO ANY SLOT		37 YES YES YES YES	29 NO NO YES NO	31 NO NO NO NO 28

Each Program was tested twice W/Apple Clock Card on a newly formatted disk containing DOS.

\*Add 5 seconds for Verify. Apple II, Applesoft & ProDOS are trademarks of Apple Computer

To Order: Send Check or Phone Visa/MasterCard.

Add \$2.00 Shipping. Overseas add US \$4.00

Calif. add 6%. All orders airmailed.

**\$39.95**

12021 WILSHIRE BLVD., SUITE 212G  
LOS ANGELES, CA 90025 (213) 478-7865

**DAVID DATA**

one disk drive and 48K of memory. Optional equipment can be a printer, Hayes Micromodem II, Dow Jones password, and second disk drive.

The manual is well written, with instructions and analysis examples. The appendix contains examples of every screen page and a list of estimated volatilities for many widely held stocks for starting a data base. The manual includes a short bibliography of related books about options trading.

The manual and demo disk are available for \$35 (credited toward purchase price). The demo disk is very thorough. It will do all the calculations, graphs, printing, and position analysis of OPVAL. It will even interface with Dow Jones. The only restriction is that the analysis is fixed at a stock price of \$50 1/4, and the Dow interface can only retrieve prices for Texas Instruments stock

and options. OPVAL costs \$250, including two master disks.

People new to options should use a full service broker to guide them through the terminology, strategies, and risks involved. Options exchanges also supply support literature, and brokers are required by law to provide clients with a prospectus from the Options Clearing Corporation.

For more information, contact Calcshop, Inc., Box 1231, West Caldwell, NJ 07007. ■

Richard M. Fuccillo  
Groton, MA

*According to Calcshop, the enhanced version of OPVAL now includes the ticker symbol for analyzed stock, and the program now can access the Warner Computer Systems Data Base.*

—eds.

## Portfolio

Portfolio is an investment simulation "board game" created and designed by Harris N. Dvors for Flexible Software. In it, you assume the role of an investment manager. After negotiating your contract, you are in charge of a company's \$10 million portfolio. The object is to increase your personal net worth, usually through performance bonuses agreed upon in your contract.

Each turn in Portfolio corresponds to one month (20 business days). Most inputs require one or more days to complete, and you can choose any action as long as you have enough time. The program does research and calculations automatically, but you must advance your token around the

Circle 387 on Reader Service card.

## WHEN THE CHIPS ARE DOWN . . .

### "master diagnostics + plus"

It's reasonable to suspect that every Apple owner has wondered at some time or another, if all those chips are working up to par, or if it's time for Disk Speed Calibration, Head Cleaning or General Maintenance . . . TM

**Master Diagnostics Plus** is a comprehensive diagnostics package for the Apple computers. As a diagnostic set, it can save unhooking all the peripherals and carrying an Apple to the dealer every time a minor hardware problem is suspected or periodic maintenance procedures are required such as DISK SPEED CALIBRATION, MONITOR ALIGNMENT, DRIVE HEAD CLEANING, etc. etc. Necessary maintenance is made easy by the routines and documentation provided

For those without a service center nearby, the diagnostic routines can save travel or shipping and considerable downtime for minor problems. Anyone fighting glitches in a program would rest a little easier knowing the computer, at least, is working properly.

As quoted in NIBBLE magazine

TM

"Master Diagnostics Plus" is an impressive collection of diagnostic routines for the Apple II and Apple II Plus. It is capable of supplying sufficient information so you know whether or not your computer is performing normally. Regular use of the maintenance routines and supplies will help to insure top-notch operation. The peace of mind afforded by being able to regularly monitor computer performance is well worth the price of the program. This package should be in the library of every Apple user . . . Also received "AAA" reviews in every U.S. Micro Mag.

Specify Version II or IIe

REQUIRES: 48K, FP IN ROM

1 DISK DRIVE, DOS 3.3

master diagnostics <sup>TM</sup> \$55.00

unlimited warranty

master diagnostics + plus \$75.00

APPLE is Registered Trademark of Apple Computer Co.

#### THE TESTS INCLUDE

- MOTHERBOARD ROM TEST
- APPLE-SOFT CARD TEST
- INTEGER CARD TEST
- MOTHERBOARD RAM TEST
- 16K RAM CARD TEST\*
- AUX RAM TEST
- 80 COLUMN CARD TEST \*
- PARALLEL CARD TEST
- SPEAKER FUNCTION TEST
- SQUARE WAVE MODULATION
- ON BOARD HELP
- DISK DRIVE SPEED CALIBRATION
- DRIVE HEAD READ/WRITE TEST
- WRITE PROTECT SWITCH TEST
- DRIVE HEAD CLEANING ROUTINES
- DISK DRIVE MAINTENANCE
- DC HAYES MICROMODEM II TEST
- PADDLE & SPEAKER TEST
- PADDLE & BUTTON TEST
- PADDLE DRIFT TESTS
- INTERNAL MAINTENANCE
- FORTY PAGE MANUAL

TM THE + plus provides everything needed to maintain your computer. The entire package is housed in our own molded case to protect against static electricity, x-ray and other contaminants.

Included in the kit is:

- THE DIAGNOSTICS DISKETTE
- FORTY PAGE PROCEDURE MANUAL
- HEAD CLEANING KIT + 2 CLEANING DISKS

- CRT SCREEN CLEANER
- COMPUTER/DRIVE HOUSING CLEANER
- REUSABLE CHAMOIS TIPPED WANDS

ORDER TOLL FREE ANYTIME or SEE YOUR NEAREST DEALER

MasterCard, Visa & C.O.D. users call: 1-800-832-2246

Kansas Residents call: 1-800-362-2421

Add: \$5.00 shipping outside U.S. & Canada



**NIKROM®**

Technical Products, Inc.

25 PROSPECT STREET • LEOMINSTER, MA 01453

game board (enclosed with the package) at every turn.

Portfolio includes many real world factors that affect investing, but some concepts are handled differently for better play. Also, it lessens the advantage that experienced traders might have over novices.

The 15 companies, whose stock you can buy or sell, each represent a different industry. Portfolio rates the financial health of the 15 companies in one of 10 categories. The categories run from AAA (highest) to D (lowest). The Official Rating scale is a relatively constant, general indicator. The Actual Rating scale is an up-to-the-minute indicator which determines the price of a company's stock, and is affected by various influences on a company.

The factors that change a company's ratings and stock price are internal and external. A factor af-

flecting only one company is internal. External factors affect the whole economy, with various results to each company.

The main screen menu can perform nine activities. The Advance choice calculates the number of squares your token will move on the game board. This is done by "rolling" two six-sided dice. The square your token ends up on will activate a sequence of events, governed by the type of square it is. The manual describes in detail the 10 types. Advancing, along with events it triggers, takes up no days.

From this menu you can also display an information screen (nine more options), purchase/sell stock, analyze commodity transactions, borrow money, make a personal purchase, and end the present month. You can also save or end a game from here.

When playing Portfolio, you are actually playing against a computer opponent, and every six months the values of your corporate holdings are compared to the computer's. Your performance bonus is calculated using the amount that you outperformed the computer, if any. You will find that the performance bonus is the best way to accumulate wealth. Portfolio also offers a handicap option for players of different skill levels.

Portfolio's realism includes taxes. At year's end, your cash balance is compared to the previous year's, and the difference is taxed at 25 percent.

Portfolio allows you to save an unfinished game (including scenario) for future play. Games can be saved on a separate, initialized disk or on the master disk.

The files of up to 15 Investment Managers can be saved on the Port-

Circle 26 on Reader Service card.

][+ or //e



And now for  
Apple ///

### YOUR KEY TO PROFESSIONAL WORD PROCESSING



**P**owerful: All the standard goodies: find, replace, move, save/insert sections. Glossary function for quick entry of commonly used phrases. Form letter (mail merge) built in. File chaining for long documents. Standard text files link to spelling checkers and databases. Printer spooling -- print one chapter while you type the next -- using RAM card or //e Auxiliary Memory.



**R**eliable: Three years of sales and user support. No surprises. No "death in the night."



**O**ptions: ZIP-COMM communications package fits inside Zardax to send or receive text easily. \$80.



**V**ersatile: Over 40 printers and many interface cards supported. You can create or modify printer files if needed. Twelve ][+ 80 column cards, plus //e text and Auxiliary Memory cards. Also works in 40 columns. Free and copyable Utilities disk available from dealers adds new devices and features as they become available.



**E**asy: Editing commands are easy to remember and teach. Two menus for disk operations and printing. Built-in print formatting commands so you don't have to mess with escape or control codes.



**N**ew for the Apple ///: More power and features at the same price -- \$210. Text files up to 197K load from ProFile in under 11 seconds. Commands compatible with ][+ and //e versions.

Just push our button - -

Dealer inquiries invited.

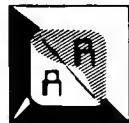
Apple ][+, //e and ///, c. Apple Computer, Inc.

Action-Research Northwest

11442 Marine View Drive, SW.

Seattle, WA 98146

(206) 241-1645 Source: CL2542



folio disk. The records are arranged by player name. Records include number of games played, awards earned, reputation, and game in progress. Each time a game is started, saved or finished, Portfolio automatically updates the files.

At the end of each game, the "retiring" Investment Manager will receive a letter from corporate headquarters. If the manager's performance has been particularly strong, he gets an award. There are five levels of awards, but the last two are definitely for expert players.

Portfolio is a realistic investment simulation game with virtually unlimited scenarios. This should make the game continually challenging for all players, and allow for improvement. The key to success with Portfolio is to make consistently wise decisions using the available information, which is abundant.

An enhanced version of Portfolio has just been released. It was designed to greatly expand the educational uses of Portfolio through user controlled options. Owners can select the initial economic conditions, enabling teachers to illustrate concepts, and investors to track the marketplace. This version is available at selected dealerships for \$64.95.

The Portfolio package includes a game disk, instruction manual, investment guide, player handbook and a foldout Portfolio board. Portfolio runs on any Apple based system with one disk drive and 48K. The disk is guaranteed for 30 days from the date of purchase. After 30 days, replacement costs \$7.50. It is published by Flexible Software, 134-10 Ivy Drive, Charlottesville, VA 22901. ■

Richard M. Fuccillo  
Groton, MA

### Circascript

Don't be deceived by fancy packages promising understandable, fast, quality word processing programs. There actually is a word processor, packed with professional features and capable of doing what word processor software packages costing up to four times as much do. It's called Circascript and, at \$39.95, there is a lot to gain for the money.

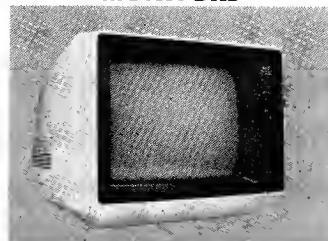
What's even more amazing, Circascript is a word processing program that actually has clear, understandable documentation. Not only can a person read and understand the instructions, but that same person can be writing and printing text files after only a few hours of work with the manual.

## COOSOL COMPUTER PRODUCTS

### COLUMBIA DATA MPC



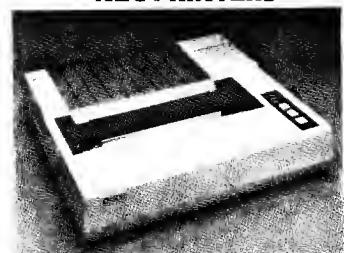
### MONITORS



### PRINTERS

- EPSON FX Series ..... CALL
- EPSON RX-80 w/GRAFTRAX + ..... CALL
- EPSON MX-100, 80, & F/T w/GRAFTRAX + ..... CALL
- OKIDATA 82A ..... \$420
- OKIDATA 83A, 84A ..... CALL
- OKIDATA 92, 93, 2350, & 2410 ..... CALL
- NEC 3550 ..... CALL
- NEC 3510, 3515, 3520, 3525, & 3530 .. CALL
- NEC 7710, 7715, 7720, 7725, & 7730 .. CALL
- NEC PC8023A-C ..... \$449

### NEC PRINTERS



- COLUMBIA System Includes: IBM COMPATIBLE Dual Floppies, 128K RAM, Two RS-232 Serial ports, Centronic Printer port, IBM Compatible Keyboard, Hi-Res Color Graphics Card, Green or Amber Monitor and more with \$3,000 Software bundle.
- COLUMBIA LOW TOTAL PRICE .... CALL

### OTHER COMPUTERS

- EAGLE II Business Computer ..... CALL
- EAGLE III Business Computer ..... CALL
- EAGLE IV Business Computer ..... CALL
- EAGLE 1630 Computer..... CALL
- All EAGLE CPUs Includes Software Bundles
- NEC PC-8001A, PC-8012A, PC-8031A, JB-1201, PC-8023 w/Software... (NEC SYSTEM) ..... \$1995
- NEC PC-8800 8-BIT or 16-BIT w/Software ..... CALL
- NEC APC SYSTEM 16 bit ..... CALL
- SANYO MBC-1000 with Bundled Software ..... \$1595
- SANYO MPC-3000 with Bundled Software ..... CALL
- SANYO—NEW PC ..... CALL

### SOFTWARE

- STONWARE ..... CALL
- SUB LOGIC—FLIGHT SIMULATOR ... \$33
- VISI CORP—VISICALC ..... \$239
- ASTON-TATE D BASE II ..... \$465
- CONTINENTAL ACCOUNTING..... CALL
- I U S EASY WRITER ..... \$89
- LOTUS ..... CALL
- MICRO PRO WORD STAR ..... \$372

### MODEMS

- HAYES SMARTMODEM (300 BAUD) .. \$227
- HAYES SMARTMODEM (300 & 1200) CALL
- HAYES CHRONOGRAPH ..... \$199
- NOVATION J-CAT ..... \$120
- NOVATION 212 AUTO-CAT ..... CALL
- SIGNALMAN MARK I and others .... CALL
- U.D.S. Series Modems ..... CALL

### CARDS

- AMDEK RGB COLOR II INTERFACE . \$169
- M&R ENTERPRISES RGB INTERFACE . \$69
- VIDWX VIDEOTERM CARD ..... \$285
- B P O 16K EPSON, OKIDATA, NEC... \$159
- WIZARD IPL ..... \$85
- OTHER APPLE CARDS ..... CALL

### CALL 7 DAYS

COOSOL, INC., P.O. Box 2642, Costa Mesa, CA 92626-2642  
Computer Baron 3017 Harbor Blvd., Costa Mesa, CA 92626 (714) 979-2488

Call. (714) 545-2216

## Software Reviews

"Circascript prints lowercase without a firmware card."

The manual is divided into two parts. The first part is for people who have never used word processing software before and who need to be taken carefully through a step-by-step tutorial. The second part of the manual, according to programmer Tom Park, is for people with prior word processing experience who want to skip the elementary instructions and descriptions and get down to some serious word processing.

Serious word processing is what this program does. Circascript prints lowercase without a firmware card. It will not cast lowercase characters on the screen, but it will print them. Capital letters are indicated on the screen by inverse display.

The program also allows the user to insert printer commands within the body of the text. These commands are used to format the page. For example, !LM10 and !RM70 are

commands which do not appear on final copy but which tell the printer to set the margin at 10 and 70 spaces, respectively.

Similar commands set and justify margins, set tabs, center the text, indent, add extra spaces between lines, and move the printer to the next page. This feature also makes special printer commands.

For example, the Okidata Microline 82A printer has four selectable character pitches (pitch means number of characters per inch or cpi). The normal mode is 10 cpi (similar to a pica typewriter). The condensed print pitch is 16.5 cpi; the boldface pitch is 8.3 cpi and the wide print is 5 cpi. The basic commands CHR\$(30), CHR\$(29), CHR\$(29)CHR\$(31), and CHR\$(31) address these four modes in programming the 82A.

Using Circascript with the Microline 82A, the command !TP30 gives normal print, !TP29 gives condensed, !TP 29 gives boldface, and !TP31 brings wide print. (Wide print is the default or automatic mode to which the Microline is addressed by Circascript.)

The manuals of other popular Apple-compatible printers will give similar instructions for setting pitch by taking the number from the CHR\$ command to make the setting.

Circascript features a global word search feature. For example, by pressing control-G for every instance of the word "command" in this article and then writing the word, the program will show every example of the word appearing in the text. This is helpful for spelling corrections. The word search can be a little awkward, however, when the word is a combination of letters such as "on," "an," "it," and "or" that can be found

Circle 204 on Reader Service card.



### LET YOUR APPLE SEE THE WORLD!

The DS-65 Digisector® opens up a whole new world for your Apple II. Your computer can now be a part of the action, taking pictures to amuse your friends, watching your house while you're away, taking computer portraits . . . the applications abound! The DS-65 is a random access video digitizer. It converts a TV camera's output into digital information your computer can process. The DS-65 features:

- High Resolution — a 256 x 256 picture element scan
- Precision — 64 levels of grey scale
- Versatility — Accepts either NTSC or industrial video input
- Economy — A professional tool priced for the hobbyist



HI-RES PICTURE USING THE DS-65 AND PICTURE SCANNER SOFTWARE

The DS-65 is an intelligent peripheral card with on-board software in 2708 EPROM. Check these software features:

- Full screen scans directly to Apple Hi-Res screen
- Easy random access digitizing by Basic programs
- Line-scan digitizing for reading charts or tracking objects
- Utility functions for clearing and copying the Hi-Res screen

Use the DS-65 for precision security systems; computer portraiture; robotics; fast to slow scan conversion; moving target indicators; reading UPC codes, musical scores and paper tape and more! GIVE YOUR APPLE THE GIFT OF SIGHT! DS-65 Price: \$349.95  
RCA 1500 Series Camera w/6:1 zoom lens Price: \$399.90/Combination Price: \$729.95

#### ADDITIONAL SOFTWARE FOR THE DS-65

— Picture Scanner: An applications tool for processing video images for display on the Hi-Res screen. A variety of dithering algorithms are provided, for compressing the digitized image into the Hi-Res screen and simulating grey scales. Price: \$39.95

— Superscan: Enables you to enhance the DS-65's Hi-Res pictures with colors! Choose from 21 different colors and assign them to grey scale values, modify pictures, zoom, enhance contrast, etc. Includes print routines for Anadex 9500 or 9501; Epson MX-80GFT and MX-100; and IDS 460 Paper Tiger\*. Written for The Micro Works by Magna Soft. Price: \$79.95

\*Paper Tiger is a trademark of Integral Data Systems, Inc.

THE  
**MICRO**  
**WORKS**

Now for IBM PC!

P.O. BOX 1110 DEL MAR, CA 92014 619-942-2400

California Residents add 6% Tax

Mastercard/Visa Accepted

in longer words. Every example of those letter combinations in the text may appear.

The word search feature is handy, but the global replace feature is more impressive. Control-S can replace any word with any other word.

For example, a student writing about twentieth century presidents may consistently confuse Theodore Roosevelt with Franklin Roosevelt. With the control-S command, the student can replace all the "Franklins" with "Theodoses" and all the "Theodoses" with "Franklins."

Circascript offers a solution to the problem of merging text files. At the end of the text, a control command (control-R) allows the user to type in the name of another file saved to disk. It automatically adds that file to the new text at any chosen point. The two files, under the file name of the new text, may be saved to disk.

For persons writing reports or documents where the organization of subject matter is difficult, this feature provides an easy, rapid way of arranging information. The only limitation is the size of the file. The maximum length is 29,000 bytes, so save to disk often.

Deleting single words, lines, or whole paragraphs is simple. Single control key commands can delete words in chunks or up to 256 characters of a whole paragraph. By using strokes of the left arrow key to eliminate a word or a letter, deletions will be more precise. Pressing the right arrow key restores text deletions. (The arrow key deletes are stored in a 256-character buffer.)

Cursor movement with Circascript is speedy and efficient. Hitting escape twice allows the IJKM keyset to move the cursor up, down, right, or left. Simultaneously, using the re-

peat key speeds that motion dramatically. If faster speed is needed, control key commands will move the cursor a half screen at a time, all the way to the beginning or to the end. Any specific point in the text may be reached quickly even without using global search functions.

Circascript also boasts a conditional paging function for reports or documents separated into sections by subheads. With the proper invisible command, Circascript starts the printing on the next page if there would otherwise have been a subheading at the bottom of the page.

Two other attractive Circascript features are its ability to work on an Apple II without Applesoft and its compatibility with Applewriter files. The documentation includes instructions for using Applewriter 1.0 and 1.5 files with Circascript. This enables two authors with different

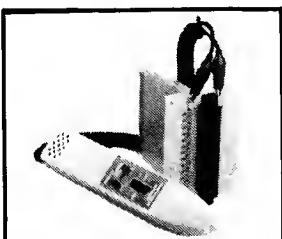
Circle 398 on Reader Service card.

### APPLE "TROUBLESHOOTING"- SAVE TIME and REDUCE ERRORS!

An extender board with a unique twist - An auxiliary board where the APPLE expansion port functions are clearly described and eyelets are provided to eliminate probe slippage and the attendant shorting of adjacent connections. With the Logic Probe shown, an audible signal describing the rhythm of dynamic data on the bus adds a new dimension to your diagnostic bag of tricks. No repair facility or serious APPLE user should be without this dynamic duo.

**COMBINATION  
\$139.95**

**BOARD ONLY  
\$99.95**



VISA/MASTERCARD and COD orders accepted.

Shipping and COD charges are extra and Virginia residents add 4% tax. Your account is not charged until the day we ship.

**CALL TOLL FREE...1-800-368-6502  
IN VIRGINIA CALL (804) 595-0866**

**HOLMES ENTERPRISES, INC.  
12361-C WARWICK BLVD.  
NEWPORT NEWS, VA. 23606**

Apple is a trademark of Apple Computer, Inc.

Circle 24 on Reader Service card.

### APPLEWARE, INC.

#### The Apple Users Group\* Software Library

For the first time enjoy your Apple to its fullest capacity, using specially packed disks with over 60 outstanding programs each..

[not available from any other source]

Each packed disk includes an extensive variety of interesting, useful and entertaining programs indispensable to all computerists! Mixed category packed disks include:

BUSINESS • EDUCATIONAL • DATA BASE • GAMES • UTILITIES • SCIENCE • MUSIC • GRAPHICS • FINANCE Library Disks I, II and III are mixed categories. Single category disks are: GAMES • UTILITIES • GRAPHICS • INTEGER • SCIENCE • TECH • MUSIC & AUDIO Individual disks available at \$59.95 each.

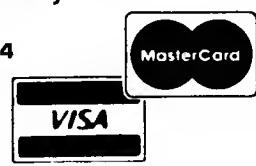
Order direct from this ad and Save up to \$150. Buy Library Disks I, II and III and get a special bonus disk FREE - over 260 programs for \$179.95 + \$4. shipping, BUT for the Best Value, receive any 9 disks featuring over 600 of our best programs for only 65¢ each for a package price of \$389. Certified Postage plus handling paid!

\*Send one-time membership fee of \$15. (no fee charged to institutions) for 1000+ program catalog and gain access to a library of over 10,000 programs at a special 15% discount (Foreign memberships \$28. U.S.)

For Orders Only Call now  
**TOLL FREE: 1-800-327-8664**  
Florida: 1-305-987-8665

Or Write:  
Appleware, Inc.  
6400 Hayes Street  
Hollywood, Fla. 33024

Program Disks compatible with Apple II, II+, III, Emul., Franklin Ace and IBM Quad



word processors to collaborate and share their work without having to retype files from one system to another.

The remainder of Circascript's features are what you would expect from any high quality word processing software package. Circascript has access to DOS and disk commands can be made from the main program menu and also from the file creating mode. There is automatic page numbering, shift lock (which is really caps lock), and readouts on demand of the amount of free memory left in the computer.

Circascript works with the Apple IIe, also. Special commands and procedures for using Circascript with the IIe are prominently flagged throughout the documentation. The procedure modifications make good use of the computer's lowercase feature and of the added keys on the IIe key-

board.

The features Circascript lacks are on-screen lowercase (when used without a lowercase adapter) and a "test print" function, which would provide a facsimile of the finished product on screen before printing starts. The documentation should be clearer about when one should switch from the program disk to the file disk. A little practice using Circascript and saving and retrieving files will straighten out that problem.

These are minor objections when compared to Circascript's overall quality and power. Circascript represents a lot of software for the money.

Circascript makes an ideal introduction to word processing for a high school or college student, and an even more valuable tool for the production of term papers, essays and reports. Apple II business users will find Cir-

cascript useful for correspondence and reports. For light to moderate business use, Circascript will fill the bill.

Circascript does not come in a fancy package and it doesn't have its own ring binder for the disk and documentation. But what the packaging lacks in flash, the program more than makes up in quality. Anyone interested in seeing what word processing is all about will find that Circascript is a friendly, low-risk introduction. At the same price as many game packages, Circascript represents a bargain worthy of investigation.

Circascript is manufactured by Circadian Software Inc., Box 1208, Melbourne, FL 32902. The program works on any 48K Apple II or II Plus and IIe. A disk drive and DOS 3.3 are also required. ■

Brian J. Murphy  
Fairfield, CT

Circle 16 on Reader Service card.

### We Help Bring Your Family Together

#### 6 Types of Charts and Sheets

Indices

User Fields

#### Notes, Footnotes and Sources

No Limits

#### Adapts to Your Hardware

Comprehensive

Easy to Use

#### And Much, Much More

Send for brochure and sample printouts.

Family Roots includes detailed manual and 2 full diskettes of programs for your Apple II\* or IBM PC\*\*

Other genealogy software also available.

Price: \$185 plus \$3.50 Postage

American Express, Visa & Mastercard Accepted



\* TM Apple Computer, Inc.  
\*\* TM International Business Machines

QUINSEPT, INC.  
P.O. Box 216, Lexington, MA 02173  
(617) 862-0404

Circle 15 on Reader Service card.

# "CATALOG"

with the flick of your little finger!

KEYFLEX™ another handy utility program from TROY SOFTWARE makes it possible.

Now you can type and even execute "CATALOG", "LIST", "CALL-151" and any other instruction or string of characters with just the flick of your finger. KEYFLEX™ does the rest.

Any key on the keyboard can be defined by you to print and even execute any command or instruction. Why not define the "C" key as "CATALOG" and maybe add "L" to "LIST" your program.

#### Contact your dealer or order direct.

(Visa and Master Charge orders accepted)

Please add \$2.50 for postage and handling.

TROY SOFTWARE DESIGN INC.  
63 Roseview Avenue  
Richmond Hill, Ontario  
Canada L4C 1C6

(416) 884-4527



Tired of typing all those "REM's when writing your APPLESOFT programs? No problem, define it as "R". Any

BASIC command can be reduced to one key. All key definitions are easily stored in a table on disk, and even swapped with other tables on disk.

KEYFLEX™ is designed to work with APPLESOFT and ProDOS.\*

Order today and let KEYFLEX™ handle your repetitive inputs and let your little finger do more than it ever did.

#### SPECIAL INTRODUCTORY OFFER

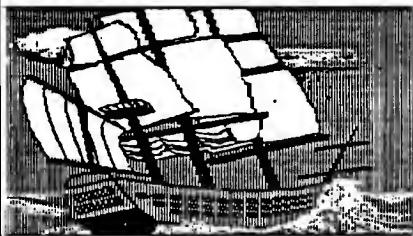
# \$39.95

Please specify  
**APPLE II or APPLE IIe.**

\* ProDOS requires 64K RAM and APPLESOFT in ROM. APPLESOFT and ProDOS are registered trademarks of Apple Computers Inc.

**ANNOUNCING****AN END TO DREARY EDUCATIONAL SOFTWARE!****THERE'S A WORM  
IN MY APPLE**

NOW IMPROVING YOUR PROGRAMMING SKILLS CAN BE AS MUCH FUN AS PLAYING GAMES. IN FACT, IT'S TWO GAMES, AND GRAPHICS, AND MUSIC, AND TALES MOTHER GOOSE FORGOT. IT'S MYSTERY, INTRIGUE, SUBVERSIVE ORGANIZATIONS, AND HUNTING DOGS. IT'S TWO DISKETTES AND 97 PAGES FULL OF FUN. AND IT'S ONLY \$39.95 (F.O.B. NILTON). THAT'S MORE FUN PER DOLLAR THAN MEASLES AND CHICKENPOX COMBINED. AND IT'S A GREAT WAY TO SPEND THE TIME IF YOU HAVE EITHER!

**ELECTRO - GRAPHICS**

**YOU DON'T HAVE TO WAIT  
UNTIL YOUR SHIP COMES IN  
TO BUY A GREAT GRAPHICS PACKAGE**

HOW FOR LITTLE MORE THAN THE PRICE OF A GAME YOU CAN OWN A TOOL THAT WILL HELP YOU CREATE GAMES, PICTURES, CHARTS ETC. NO EXPENSIVE EXTRA HARDWARE TO BUY. EZ KEYBOARD-JOYSTICK CONTROL AND UNIQUE 'OVERLAY' SYSTEM MAKES PRECISE DRAWING OR FREEHAND SKETCHES A SNAP!

**FEATURES INCLUDE:** LORES OR HIRES DRAW • CUSTOM COLORS • TEXT IN COLOR • SHAPE TABLE CREATION • SCROLL • INVERSE

**ONLY \$49.95**

SEND CHECK OR MONEY ORDER TO  
**MICROMINDS UNLIMITED**  
200 WALKER LAKE ONTARIO ROAD  
NILTON, NEW YORK 14468  
OR TELEPHONE: 716-964-7200

# Cider Vinegar

## Presidential Power, March

My Presidential Power simulation published in the March 1984 issue of *inCider* would benefit from the following improvements.

1) SET UP should be modified by inserting these lines:

```
45 GOTO 140
135 GOTO 170
165 GOTO 50
```

2) There is a typo in line 20 of RESULTS. CHR4 should read CHR\$.

Several readers have expressed an interest in modifying and extending the simulation. I've encouraged people to forward their enhancements to *inCider* so they may be shared with other readers.

Joel J. Davis  
142 Wildwood  
Algonquin, IL 60102

## inSidious inSolubles Solution, from p. 82

### The Savings Accrual Solution

$$70 \text{ TA} = \text{TA} + \text{A} + \text{RA} * \text{TA} + (\text{RA} * \text{A} / 2)$$

The algorithm in line 70 must continue to add the amount contributed each year to the total already in the account (TA + A). In addition, the amount already in the account must earn interest (RA × TA). And—the amount added each year is added *monthly* (did you read the explanation?) and so earns interest for half a year (RA × A/2).

**ONE PASS COPY****\$29.95****The Copy Machine****Does for disks what Xerox did for paper.**

- Don't let backing-up slow you down.
- Examples: Copy Apple System Master on one drive in one pass and 38 seconds compared to two and a half minutes with COPYA.
- Copy a disk with a 128 sector game on two drives in EIGHTEEN SECONDS (!) vs. 1 minute 33 seconds with COPYA.
- This is the fastest possible copy system on Apples.
- Make backing up a pleasure. Copy most disks in one pass and a fraction of the time.
- Change parameters — INIT, bypass bad sectors, etc.
- If you backup your work, you owe it to yourself to use ONE PASS COPY.

**RAM DRIVE \$24.95**

- Use your extra memory as a Disk Drive. **No hardware needed.**
- All DOS commands work the same.
- 310 sectors with a 128K Apple IIe, 63 sectors on any 64K Apple IIe or II+. That's more room than any other software.
- Incredibly fast — you have to see it to appreciate the speed and reliability.
- Full package of utilities.

**SPEED-DOS \$24.95**

- Improves SAVE, LOAD, BLOAD, BSAVE, RUN and BRUN times **up to 500%.**
- Compatible with RAM DRIVE, all DOS commands, most programs.
- Bload HI-RES screen from floppy in 3 seconds, from RAM DRIVE in half a second!
- Completely unprotected. Add to any program.

**SPECIAL POWER PACK  
GET ALL 3 DISKS**

for only

**\$49.95****To Order:**

- 1) Mail or phone orders accepted.
- 2) Check, COD, VISA or MC (include exp. date and signature)
- 3) Add \$1.50 U.S. shipping
- 4) Add \$5.00 foreign
- 5) Specify 64K or 128K Apple when ordering RAM DRIVE

**Software banc, inc.**

1225 N. Water Street

Milwaukee, WI 53202

(414) 271-0100 (312) 876-0715

**"AUTHOR  
AUTHOR!"**

**The call for authors is out!**

**Wayne Green Books** is accepting manuscript proposals for the upcoming publication list. Ideas for book-length manuscripts about any microcomputer system or area of electronics will be considered. In addition to payment and royalties, we offer our distribution channels and the marketing support your book deserves.

Send proposals or requests for a copy of our Writer's Guide to:

**Editor, Wayne Green Books**

Peterborough, NH 03458.

Or call toll-free **1-800-343-0728.**

Have you placed your vote for *inCider's* best advertisement of the month?

To do so, simply turn to the reader service card and fill in the company name and reader service number.

## APPLE CPM UTILITY PAK #2

\$39

Two of CP/MUG's most useful CP/M tools at a bargain price:

—A powerful and flexible 8080 O/SASSEM8LER - binary file in, source file out!  
—An excellent DISK ZAP (inspect-and-change) utility - for any Apple disk-type device! UTILITY PAK #2 includes our own detailed user manual which provides in-depth tutorials on the art of disassembly and the mysteries of Apple CP/M file and diskette formats (recover erased files, blown diskettes, garbled directories, etc.). You'd pay twice this price for each utility (without tutorials) elsewhere.

## APPLE CPM UTILITY PAK #1

\$39

Nine CP/MUG utilities adapted and documented (40 pages!) specifically for Apple CP/M.

—EXtended OIRECTORY (with file sizes and sort and attribute selection options)  
—Multi-Diskette Volume CATALOGER  
—BATCH CP/M commands on one line  
—Conditional SUBMIT file processing  
—LIST selected PARTS of a text file

—Single Drive File COPY  
—COUNT text file lines  
—Sort And Pack diskette directory  
—LISTFILE (numbers & separates pages)

## Pascal/CPM/DOS FILE TRANSFER UTILITIES

\$45

Move your Pascal text files to CP/M or Pascal for editing, move DOS data to CP/M or Pascal for processing with high level languages, etc. FTU consists of six programs to transfer any file among the Apple DOS, CP/M, and Pascal operating system environments. Allows a single disc to hold files for all three systems.

## CLOCKWARE

\$25

Provides access from Pascal programs to all time and date setting and reading functions of Prometheus Versacard and other Thunder-type clock calendars in any slot (1-7). Includes SYSTEM. STARTUP programs to set the system date at bootup, demo programs, and a complete and informative user manual.

## APPLE II ↔ IBM PC FILE TRANSFER SERVICE

Write for information and pricing

SEE YOUR DEALER OR ORDER DIRECTLY (VISA/MASTERCARD ACCEPTED) FROM:

## RCM SOFTWARE

4608 Renwood Drive • Kettering, Ohio 45429

Now you can monitor and control the world (or at least your part of it) with a little help from  
**APPLIED ENGINEERING**

### 12 BIT, 16 CHANNEL PROGRAMMABLE GAIN A/D

- All new 1984 design incorporates the latest in state-of-the-art I.C. technologies.
- Complete 12 bit A/D converter, with an accuracy of 0.02%!
- 16 single ended channels (single ended means that your signals are measured against the Apple's CND) or 8 differential channels. Most all the signals you will measure are single ended.
- 9 software programmable full scale ranges, any of the 16 channels can have any range at any time. Under program control, you can select any of the following ranges: ±10 V, ±5 V, ±2.5 V, ±1.0 V, ±500 MV, ±250 MV, ±100 MV, ±50 MV, or ±25 MV.
- Very fast conversion (25 micro seconds).
- Analog input resistance greater than 1,000,000 ohms.
- Laser-trimmed scaling resistors.
- Low power consumption through the use of CMOS devices.
- The user connector has +12 and -12 volts on it so you can power your sensors.
- Only elementary programming is required to use the A/D.
- The entire system is on one standard size plug in card that fits neatly inside the Apple.
- System includes sample programs on disk.

**PRICE \$319**

### 8 BIT, 8 CHANNEL A/D

- 8 Channels
- 8 Bit Resolution
- On Board Memory
- Fast Conversion (.078 ms per channel)
- A/D Process Totally Transparent to Apple (looks like memory)

The APPLIED ENGINEERING A/D BOARD is an 8 bit, 8 channel, memory buffered, data acquisition system. It consists of an 8 bit A/D converter, an 8 channel multiplexer and 8 x 8 random access memory.

The analog to digital conversion takes place on a continuous, channel sequencing basis. Data is automatically transferred to on board memory at the end of each conversion. No A/D converter could be easier to use.

Our A/D board comes standard with 0, 10V full scale inputs. These inputs can be changed by the user to 0, -10V, or -5V, +5V or other ranges as needed.

The user connector has +12 and -12 volts on it so you can power your sensors.

- Accuracy: 0.3%
- Input Resistance: 20K Ohms Typ

**PRICE \$129.00**

### SIGNAL CONDITIONER

Our 8 channel signal conditioner is designed for use with both our A/D converters. This board incorporates 8 F.E.T. op-amps, which allow almost any gain or offset. For example, an input signal that varies from 2.00 to 2.15 volts or a signal that varies from 0 to 50 mV can easily be converted to 0-10V output for the A/D.

The signal conditioner's outputs are a high quality 16 pin gold I.C. socket that matches the one on the A/D's so a simple ribbon cable connects the two. The signal conditioner can be powered by your Apple or from an external supply.

### FEATURES

- 4.5" square for standard card cage and 4 mounting holes for standard mounting. The signal conditioner does not plug into the Apple, it can be located up to 1/2 mile away from the A/D.
- 22 pin .156 spacing edge card input connector (extra connectors are easily available i.e. Radio Shack).
- Large bread board area.
- Full detailed schematic included.

**PRICE \$79.00**

### DIGITAL INPUT/OUTPUT BOARD

- Provides 8 buffered outputs to a standard 16 pin socket for standard dip ribbon cable connection.
- Power-up reset assures that all outputs are off when your Apple is turned on.
- Features 8 inputs that can be driven from TTL logic or any 5 volt source.
- Your inputs can be anything from high speed logic to simple switches.
- Very simple to program, just PEEK at the data.
- Now, on one card, you can have 8 digital outputs and 8 digital inputs each with its own connector. The super input/output board is your best choice for any control application.

The SUPER INPUT/OUTPUT board manual includes many programs for inputs and outputs. A detailed schematic is included.

### Some applications include:

Burglar alarm, direction sensing, use with relays to turn on lights, sound buzzers, start motors, control tape recorders and printers, use with digital joystick. **PRICE \$69.00**

Please see our other full page ad in this magazine for information on Applied Engineering's Timemaster Clock Card and other products for the Apple. Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products compatible with Apple II and II/e.

Applied Engineering's products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle three year warranty.

Texas Residents Add 5% Sales Tax  
Add \$1.00 If Outside U.S.A.

Send Check or Money Order to:  
**APPLIED ENGINEERING**  
P.O. Box 798  
Carrollton, TX 75006

Call (214) 492-2027  
7 a.m. to 11 p.m. 7 days a week  
MasterCard, Visa & C.O.D. Welcome  
No extra charge for credit cards

# New Publications

edited by Joan Witham

## Handbook for Business Managers

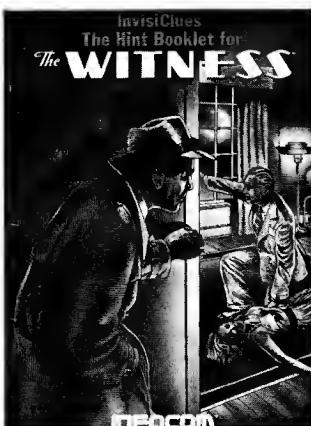
To help business owners and managers with little or no background in computers, Chilton Book Co., Radnor, PA 19089, has published the *Handbook of Computer Applications for the Small or Medium-Sized Business* (\$19.95). It covers everything a manager needs to know about business and computers, including local computer networks and 16-bit micros.

## Logo Information and Program Exchange

The Young People's Logo Assoc., PO Box 855067, Richardson, TX 75085, has published the *YPLA Software Exchange Catalog Supplement*, which lists programs that may be obtained by sending either money or a program written in Logo. Another service they provide is The Midnight Turtle, a Logo information exchange in operation from 7PM to 7AM that features electronic mail, up- and downloading of Logo software and five bulletin boards.

## Computer News by Tape

*Computer News Audio Digest* (\$195), a recorded twice-monthly digest of current computer news from key computer journals, can keep executives up-to-date on computer news while driving to work or opening their morning mail. For further information on this digest, contact Computer News Audio Digest, PO Box 10266, Stamford, CT 06904.



Infocom clues.

## Critic's Guide to Software

A *Critic's Guide to Software for Apple and Apple-Compatible Computers* contains information on business software for managers and professionals. It is available for \$12.95 from Chilton Book Company, Radnor, PA 19089.

## Educators' Road Map

Educators looking for a road map to the human side of technology can find help in the *1984 Directory of Resources for Technology in Education* (\$12.65, paperback), published by the Technology Learning Center, Far West Laboratory for Educational Research and Development, 1855 Folsom St., San Francisco, CA 94103. The directory provides information about national and state associations, resource organizations, state departments of education, computer camps, periodicals, databases, electronic bulletin boards, hardware companies, summer institutes, conferences, degree programs and funding sources.

## Computer Investors Journal

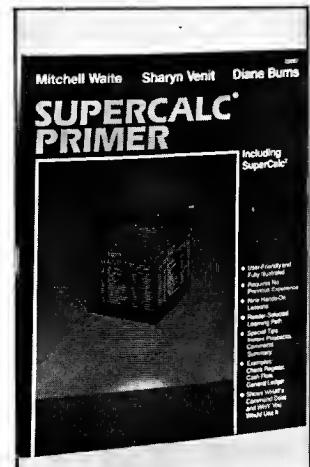
In-depth articles and reviews of investment software and books as well as member software discounts are available in the *AAMI (American Association of Microcomputer Investors Inc.) Journal*. For a sample issue, send \$3.00 to the AAMI, PO Box 1384, Princeton, NJ 08542.

## Bulletin Board Directory

*The National CBBS Directory* (\$2) contains over 1000 computer bulletin board telephone numbers in numeric sequence, identifying the BBS type, its baud rate, operating hours and other pertinent facts. For further information, contact Thomas Wnorowski, 3352 Chelsea Circle, Ann Arbor, MI 48104.

## Infocom Game Maps/Hints

Players in need of help in the Infocom series of adventures (Zork, Planetfall, Deadline, etc.) can look to a series of InvisiClues hint books and game maps. They are available for \$7.95 for each game from Infocom, PO Box 855, Garden City, NY 11530.



Learn SuperCalc by making predictions and doing modeling.

## Index of Apple Articles

*Microindex*, a comprehensive index to microcomputer-oriented periodicals, includes title, author, page, length, journal, issue, reader level and rating. The full version is available on a monthly basis to large libraries for \$99 yearly; the abridged version (\$49) is for medium-sized libraries and small businesses; and the journal-specific version (\$5-\$12, yearly issue) is for individual users. Contact Serious Personal Computing, PO Box 7059, South Nashua, NH 03060, for further information.

## SuperCalc Primer

In 218 pages, *SuperCalc Primer* (\$16.95) teaches novice users how to harness SuperCalc's power in "what-if" problems, making investment predictions and doing financial modeling. For further information, contact Howard W. Sams & Co. Inc., 4300 West 62nd St., Indianapolis, IN 46268.

DISK DRIVES DISK DRIVES

# PRICE BREAKTHROUGH

## Super Sale on New Disk Drives

Starting at \$169.00! NEW  
LOW PRICE

Tandon — Siemens — Remex — MPI — Teac — Shugart — Tabor

40 or 80 Tracks — Single or Dual Head — New 3½" Drivette™

Our Disk Drives are Capable of Single and Dual Density Operation

The NEWEST Technology Capable of Operating on Most Popular Computers

Drive a Hard Bargain!!™ For your TRS/80, Color Computer, IBM, Apple, Franklin  
5 M.B.-20 M.B. Complete Systems..... from \$999.95

Diskette Breakthrough — 10 Pack in Library Case — \$18.95 NEW  
LOW PRICE

SAVE!! PLEASE CALL FOR OUR MOST CURRENT PRICE REDUCTIONS.

**TOLL FREE ORDERING**

**1-800-343-8841**

**GENERAL AND TECHNICAL**

**1-617-872-9090**

Disk Drives (0123) TRS/80-IBM-Apple-TI 99/4A-Franklin-Max/80-LNW .....	CALL
Model I/III/IV Upgrade (Disk Drives-Memory) .....	TOLL
Printers—Daisywheel/Dot Matrix .....	FREE
Percom Double Density Controller (Model I) .....	FOR
Color Computer Printer Interfaces .....	NEW
Disk Drive Operating Systems .....	PRICES
Repair Services Now Offered—FAST Turn-a-Round .....	
Apple/Franklin Compatible Add-On Drives with Case & Cable .....	
Diskettes in Library Cases .....	
<b>DISK DRIVE CASES AND POWER SUPPLIES</b> .....	starting at \$59.95
Printer Buffers 8K to 512K .....	starting at \$143.95
Holmes Model I/III speed-up Mod .....	starting at \$90.00
Cables—Printer/Disk Drive .....	starting at \$23.00

Warranty on Disk Drives — 6 Months to 1 Year

## SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701 (617) 872-9090  
Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

Service! Service!

### DEALER INQUIRIES INVITED.

TERMS:  
M.C./Visa/Amex and personal  
checks accepted at no extra charge.  
C.O.D., please add \$3.00.  
Shipping: Please call for amount.  
Not responsible for typographical errors.

**CANADA**  
**MICRO R.G.S. INC.**  
751, CARRE VICTORIA, SUITE 403  
MONTREAL, QUEBEC, CANADA, H2Y 2J3  
Regular Tel. (514) 845-1534  
Canadian Toll Free 800-361-5155

All in stock products are shipped  
within 24 hours of order.  
Repair/Warranty service is performed  
within 24 hours of receipt unless  
otherwise noted. We accept C.O.D.,  
foreign and APO orders. School  
and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. IBM-PC Registered IBM Corp. Apple Registered Trademark Apple Computer Corp.  
Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

# New Software

edited by Joan Witham

## Disk from Datasoft

New entertainment games from Datasoft Inc. include the following programs for \$29.95: Nibbler, a test of your quickness and judgement in a race against time to devour everything in your path; Bruce Lee, based on the life of the late martial arts expert; Letter Wizard, which adds a new dimension to Datasoft's word processing programs; Genesis, a heated battle for survival with venomous spiders; Ultra Plan, a spreadsheet for planning and forecasting home expenses; and Lost Tomb, a suspense-filled tomb of horrors arcade game.

The Dallas Quest, inspired by the popular TV series, is priced at \$34.95. Heathcliff (\$34.95), based on the beloved animated character, stars in software to teach reading and spelling skills. Contact Datasoft Inc., 19808 Nordhoff Place, Chatsworth, CA 91311, for more information. Reader Service number is 452.

## New on the Market

Game programs from a new company, Three Sigma Inc., include Secret of Easter Island (\$30), an adventure where you must find the mysterious idol to save the island from volcanic devastation; Fireware Pinball (\$30), three fast-action pinball games on one disk; Space Spikes (\$20), a shoot-'em-up; and Vegas\$ Video (\$20), simulating a card game in which you bet against the house.

Some of their educational programs are Math Reviewer (\$50), which includes hundreds of lessons



TV stars now star in computer programs.

on exponents, trigonometry, metrics and more; Frog Dissection (\$45), an organ-by-organ tour through a frog with investigations of each of the frog's systems; the Gene Scene (\$45), a human genetics game that teaches basic Mendelian principles and various considerations in genetic counseling; and SAT Review.

All programs may be or-

dered from Three Sigma Inc., PO Box 716, Morrisville, PA 19067, with the addition of \$3 for shipping and handling. Reader Service number is 454.

## Financial/Basic Tutorial Programs

Managing Your Money was designed by Andrew Tobias, best-selling author of *The Only Investment*

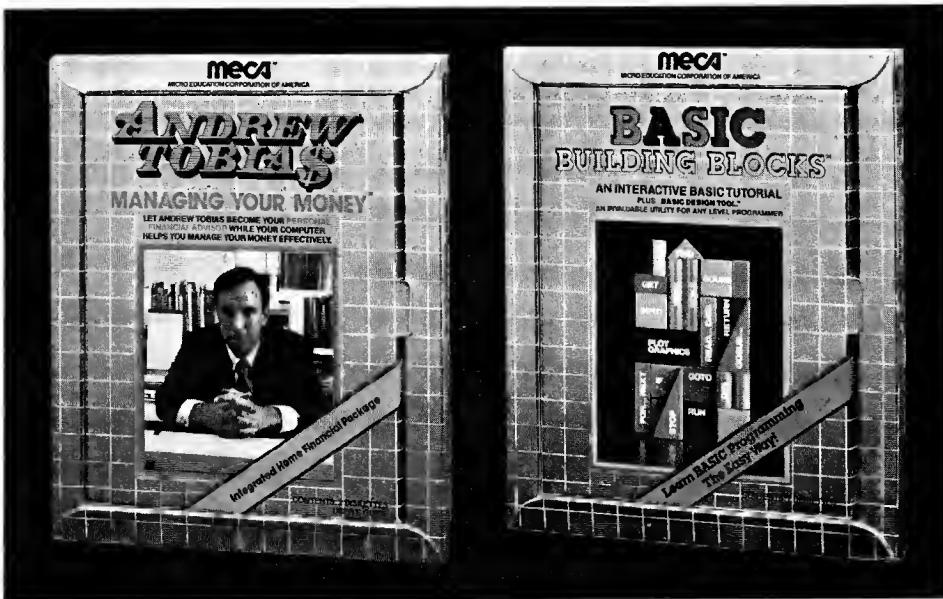
Guide You'll Ever Need and *The Invisible Bankers*. This integrated home financial package retails for \$199.99.

A simple-to-use interactive Basic programming tutorial, Basic Building Blocks allows users to study actual programs as they execute. Debugging programs as well as learning Basic is another key feature. It sells for \$79.99.

For information on both programs, contact Micro Education Corp. of America, 285 Riverside Ave., Westport, CT 06880. Reader Service number is 462.

## Integrated Software Is Simply Perfect

Simply Perfect, an integrated version of Letter Perfect, Spell Perfect and Data Perfect, is designed specifically for the Apple IIe. Priced at \$189.95, it requires an extended 80-column card. For further information, contact LJK



Manage your money with MECA software programs.

Circle 367 on Reader Service card.

# wabash

six-year warranted  
DISKETTES!  
**\$18.95/box (10)**  
with FREE library case!

5 1/4" single-side, single-density; double-density add \$2./box 8" disks comparably priced. Add \$2 per order shipping. In Illinois add 6% sales tax. Immediate shipment on VISA, Master Card or Money Order. Add 14 days for personal checks.

 CALL TOLL FREE  
(800) 222-1248

In Illinois Call (312) 882-8315

DEALERS/ SCHOOLS/ USER GROUPS!  
Call for our low volume discount prices!

**DIGITAL IMAGES**  
Box 941005, Schaumburg IL 60194

this publication  
is available in  
microform

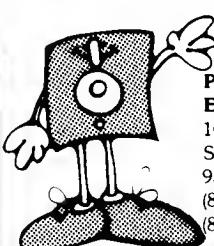


University Microfilms International

300 North Zeeb Road 18 Bedford Row  
Dept. P.R. Dept. P.R.  
Ann Arbor, MI 48106 London, WC1R 4EJ  
U.S.A. England

## MEMOREX FLEXIBLE DISCS

WE WILL NOT BE UNDER-SOLD!! Call Free (800)235-4137 for prices and information. Dealer inquiries invited and C.O.D.'s accepted.



### PACIFIC EXCHANGES

100 Foothill Blvd.  
San Luis Obispo, CA  
93401. In Cal. call  
(800)592-5935 or  
(805)543-1037

Circle 31 on Reader Service card.

## Easy-View™ Disk File Work Station



- Stores 100 Disks, Dust Free
- 25 Disk Titles Clearly Visible
- Fast, Easy Access, Stackable
- Top Flips Back, Locks Upright

**RULE ONE** **\$995** Add \$1.50  
42 Oliver Street Dept. B Postage & Handling  
Newark, N.J. 07105 Cash, check or M.O. No C.O.D.'s

Circle 356 on Reader Service card.

## Subscription Problem?

inCider does not keep subscription records on the premises, therefore calling us only adds time and doesn't solve the problem.

Please send a description of the problem and your most recent address label to:



Subscription Dept.  
PO Box 911  
Farmingdale, NY 11737

Thank you and enjoy your subscription

We Will BEAT Any Advertised Price or You Receive a FREE Gift!!

	1	Buy 2 to 4 Boxes	Get a Library Case With Ea. Box	
REG. PRICE	5 1/4"	28.95	55.00 SOFT SECTOR	Free
	39.50	5 1/4"	DS/DD SOFT SECTOR	SO. VALUE
SPECIAL	VERBATIM	5 1/4"	23.40	
	MEMOREX	5 1/4"	23.40	
	3M - SCOTCH	SOFT SECT.	22.40	
Add \$2.00	Handling in USA			
VISA	C.O.D.			
	5% Tax in Fla. Only			
	APG/ Box Note & Canada			
	Add 3.50 Shipping			
	MEGA 8 BYTE			
	4699 S.W. 45th Street			
	Ft Lauderdale, Florida 33314			
	305 587 1130			
	1-800-327-1013			

Allow one week delivery. This offer may be restricted anytime.

Circle 393 on Reader Service card.

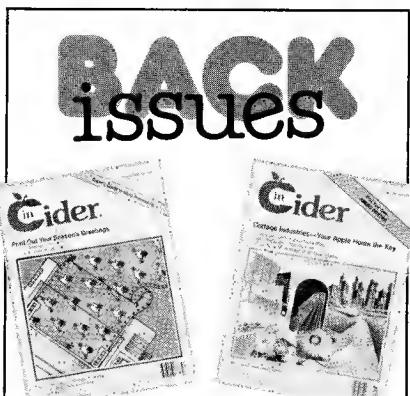
## Super Savings Apple Compatible Equipment

- 1/2 High Drives.....\$159.95
- Controller Cord.....44.00
- Heavy Duty Joy Stick.....24.95
- Cooling Fan.....38.00
- 80 Column Cord.....119.95
- Monitor - Amber.....119.00  
Toxon 210 Color.....299.00
- Apple III System, 256KB.....1,595.00
- C ITOH 8510 Printer.....375.00
- Graphics Tablet.....99.00

## THE LAST ENTRY

414 N. STATE COLLEGE BLVD.  
#C182 - ANAHEIM, CA 92806

**714-978-9833**



January 1983 to present  
Single back issue ..... \$3.50  
Add \$1.00 per magazine for shipping  
10 or more back issues add \$7.50 per  
order for shipping.

inCider Back Issue Order Dept.  
80 Pine Street  
Peterborough, NH 03458

Circle 67 on Reader Service card.

## P.F.S.\* Users, Time is Money!

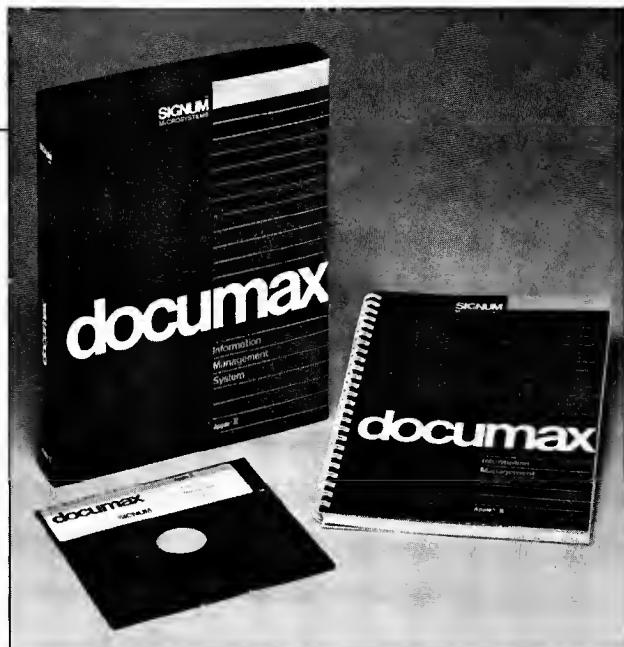
Your entire program can run  
2 1/2 times faster with our  
New Speedup System!

\*trademark: Software Pub. Co.



The Lobero Building P.O. Box 2342  
Santa Barbara, Ca. 93120  
(805) 966-1140 Telex 658439

## New Software



*Documax is an electronic file cabinet.*

Inc., 7852 Big Bend Blvd.,  
St. Louis, MO 63119. Reader  
Service number is 450.

### Electronic File Cabinet

Documax is a fast, easy-

to-use document-handling system which combines the functions of accessing, storing and organizing documents. Totally menu-driven, a full disk can be searched in less than 90 seconds. Compressed files double the capacity of the disk, which holds 60 pages of text. Suggested software price is \$175 for the Apple II Plus, IIe or the III in the Apple emulation mode. Signum Microsystems Inc. may be contacted at 120 Mountain Ave., Bloomfield, CT 06002, for further information. Reader Service number is 460.

### Work Force II

Work Force II is a col-

lection of six menu-driven programs for the home and office. CAT is a catalog program. The Balancing Act balances checkbooks. Calculator is a four-function printing calculator with memory and percent. Loan Analyzer computes loans and mortgage amortizations, total interest paid and payments made, daily percentage rate and amount of each payment. Savings Analyzer computes the future value of savings, IRAs and investments. Wage Analyzer figures wages or income by the hour, weekly, biweekly, semi-annually and annually. Line Writer is a line-at-a-time typewriter.

Contact Core Concepts,

## ATTENTION *subscribers!*

We occasionally make our mailing list available to other companies or organizations with products or services which we feel might be of interest to you. If you prefer that your name be deleted from such a list, please fill out the coupon below or affix a copy of your mailing label and mail it to:

The Wayne Green  
Publications Group  
inCider  
PO Box 911  
Farmingdale, NY 11737

Please delete my name from mailing lists sent to other companies or organizations.

name \_\_\_\_\_

address \_\_\_\_\_

city \_\_\_\_\_ state \_\_\_\_\_ zip \_\_\_\_\_

**C**ider™  
Green's Apple® Magazine

## Reader Service

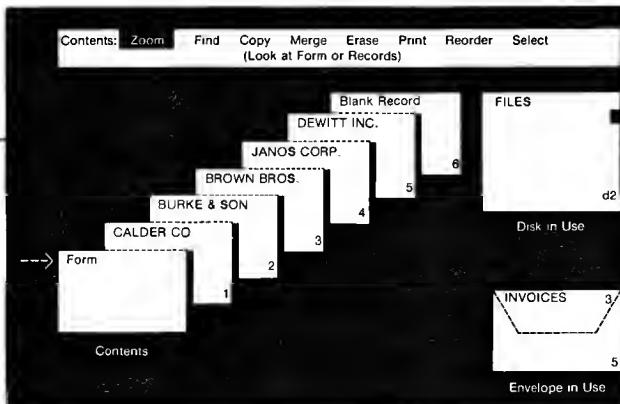
TO RECEIVE MORE INFORMATION ON THE PRODUCTS AND SERVICES ADVERTISED IN THIS ISSUE, PLEASE TURN TO READER SERVICE CARD.

## New Software

PO Box 24157, Tempe, AZ 85282, for further information. Reader Service number is 457.

### Does Not Do Windows

Originally designed for the IBM PC, the Apple version of Jack2 is a significant improvement over The Incredible Jack. Jack2 is an integrated program that does word processing, spreadsheeting, charting and database management tasks simultaneously, without windows. Icon-driven commands make it easy to use. Priced at \$395, it can be obtained from computer stores or from Business Solutions Inc., 60 Main St., Kings Park, NY 11754.



Jack2 is here for the Apple.

Reader Service number is 455.

### Telecommunications Module/Program Selector

Terminus IIe, an integrated telecommunications module for Word Juggler, offers special transmission modes to send and receive any type of file, whether

a Word Juggler document, a Pascal code file or an assembly language program. Suggested retail price is \$89.

Catalyst IIe is a ProDOS program selector for hard disks that switches between copy-protected programs without the need to reboot. Suggested retail price is \$149.

For further information on the above programs, contact Quark Inc., 2525 West Evans, Suite 220, Denver, CO 80219. Reader Service number is 456.

### Mysterious Journey

Questron is a journey, filled with mystery, secret tests and tremendous magical powers, to defeat hoards of Stygian creatures and monsters. Your quest is to seek out the diabolical wizard Mantor, purloin the Book of Evil Magic and save the Questron empire. Strategic Simulations, 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043, offers this fantasy adventure game for \$49.95.

Circle 509 on Reader Service card.

## COMPETITION RACING by Apple-Pi Micro

Requires: 48K / Apple II, II+, IIe, Franklin Ace / Game Paddles or Joysticks / DOS 3.3

Hi-Res Machine Language Gran Prix TEAM Race  
1-2 Players — 1-4 Cars per Team — Color or B&W  
7 Layers of Priorities — 7 Levels of Speed

You are the Team Manager & Relief Driver. You control up to four cars (with a game paddle or joystick), monitor gas & tires to make pit stops, and drive any car at any time: shifting gears, changing lanes, and avoiding crashes.

Over 100 sectors of binary logic and 7 layers of priorities give you the genuine feel of racing.

**Features:** Color option, Software Trim Setting, 5 speed graphic gear shift, lap & point counter, pit boards, caution light, random weather, and a Graphic Menu for race initialization.

**Good Documentation** includes a Reference Card for Controls, Priorities & Options.

**Replacement Policy:** \$6/disk up to 1½ years from registered purchase & return of defective disk.

**\$32.50**

Ohio residents add 5½% sales tax  
Overseas, add \$5.00 for air mail postage  
(U.S. currency only).  
Welcome Dealer Inquiries

**Apple-Pi Micro**  
3166 Patsy Dr.  
Beavercreek, Ohio 45385

Apple is a registered trademark of Apple Computer, Inc.

Check/Visa  
Mastercard  
Incl. Exp. Date

Circle 163 on Reader Service card.

## PUT YOUR APPLE TO WORK GET WORK FORCE II. T.M.

A collection of 6 new ultra-friendly programs.

1. THE LOAN ANALYZER  
loan and mortgage amortization.
2. THE CALCULATOR  
4 function printing calculator with memory & %.
3. THE LINE WRITER  
a line-at-a-time correctable typewriter.
4. THE SAVING ANALYZER  
analyzes future value of savings, investments, & rates.
5. THE WAGE ANALYZER  
examines your income and pay raises.
6. THE BALANCING ACT  
once a month checkbook balancing.

**ALL SIX ONLY \$29.95**

Manual & Shipping Included

Our Software is Copyable & Affordable. *Insist On It!*

Requirements: Apple IIe, II+, or II with 48k, & DOS 3.3, printer optional.

Apple, Apple II, II+, and IIe are trademarks of Apple Computer, Inc.

Please send me \_\_\_\_\_ copies of WORK FORCE II at \$29.95 each.

check or money order.  American Express  COD (add \$3.00 for COD)

Arizona residents add 6% Sales Tax. Overseas add \$4.00.

Card # \_\_\_\_\_ (15 digits)

Signature \_\_\_\_\_ Valid From \_\_\_\_\_ to \_\_\_\_\_

Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Mail To: \_\_\_\_\_ Core Concepts

P.O. Box 24157 Tempe, AZ 85282  
(602) 968-3756  
DEALER INQUIRIES INVITED



All orders shipped immediately!

# Some of the World's Largest computer companies Call Us for medical systems on their machines. Why don't you...

The reason is simple. We do a better job and have more features than our competitors. Below are just a handful of our special features.

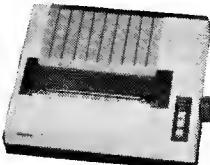
- AMA Claim Form • Multiple Providers • Daily Journal • Productivity Report • Superbill • Referral Letters
- RVS/ICDA Codes • Patient Recall • Financial Histories
- Hotline Service • Word Processing • Apt. Reminder • Collection Report • Private A/R Aged
- Manual & Training System Available • 100,000 Patients • 22,000 Patient Appointment System

Call your dealer for a FREE demonstration or call CMA about our low cost "See it in Your office" training units.



**MICRO COMPUTER DIVISION**  
55722 Santa Fe Trail  
Yucca Valley, California 92284  
(619) 365-9718

## Large Selection - BIG Savings



Epson \$CALL



CITOH Prowriter \$359  
CITOH Prowriter II \$565



Silver Reed EXP500 \$425  
Silver Reed EXP550 \$515



Okidata \$CALL

### PRINTERS

Star Gemini 10X	\$289
Star Delta-10	415
Star Gemini 15X	409

### MONITORS

Amdek Color I+	299
BMC Color	255
BMC Green	99
Taxan Green	130
Taxan Amber	139

### MODEMS

Hayes Micromodem IIE	225
Smartmodem 300	225
Smartmodem 1200	539

**CALL TOLL FREE  
1-800-343-8124**

- LOWEST POSSIBLE PRICES
- BEST POSSIBLE WARRANTY
- KNOWLEDGEABLE SALES STAFF
- TIMELY DELIVERY
- SHOPPING CONVENIENCE



**computer plus**  
P.O. Box 1094  
480 King Street  
Littleton, MA 01460 SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

## New Software



The latest educational games from Reader's Digest.

### Preschool Learning at Home

Reader's Digest, Pleasantville, NY 10570, has announced new software packages for the home educational market. Alphabet Beasts & Co. (\$34.95) shows pictures of fantasy beasts and a musical rhyme when a letter key is pressed. Numbers are also displayed in both numeric and written form. Little People's Puzzles/Nursery Rhymes (\$39.95) features colorful puzzle pictures from eight different nursery rhymes to be assembled by preschoolers. Reader Service number is 464.

\$49, features a cast of characters supported by individual dossiers in the accompanying documentation. Skillful tactics of the competing attorneys win the trial, with the computer as judge.

Contact Navic Software, North Palm Beach, FL 33408, for further information. Reader Service number is 465.

### Espionage

The Heist, an espionage arcade game that maneuvers you through 96 different booby-trapped rooms, should be another hit like Miner 2049er from Micro Lab. This program is available for \$40 from computer stores or Micro Lab, 2699 Skokie Valley Road, Highland Park, IL 60035. Reader Service number is 467.

### You're on Trial

Jury Trial II, a courtroom strategy game for

**JURY TRIAL II**

The Courtroom Strategy Game  
by NAVIC SOFTWARE

Courtroom strategy game.

### Heyden Datasystems New Software

Heyden & Son Inc., a leader in scientific, technical and medical publications, has announced a new division, Heyden Datasystems. Some of their software programs are MUM (\$24.50), a versatile utility program; Microfile (\$75), the personal library ideal for collections of reprints and articles; Superstats (\$215), 26 commonly used statistical routines;

## New Software



A complete computer literacy course.

and Autovideogram (\$385), for easy, fast and reproducible chromatography integration. For more information, contact Heyden & Son Inc., 247 South 41st St., Philadelphia, PA 19104. Reader Service number is 466.

### New Software for the Power Pad

Open-ended learning and entertainment are offered in Chalk Board's new software to be used in conjunction with the Power-Pad. These additions to Leonardo's Library are Leonardo's Logo (creating shapes, patterns and designs), Boolean Blueprints (advanced Basic programming), Runway (learning navigation and piloting) and Borderlines (simulating international relations). Each package includes the software, as well as a tough plastic overlay imprinted with function buttons and a manual describing a number of learning activities. Prices range from \$29.95 to \$49.95.

For further information, contact Chalk Board Inc., 3772 Pleasantdale Road, Atlanta, GA 30340. Reader Service number is 451.

### Electronic Playground

Designed for children three to eight years old,

Electronic Playground (\$24.95) is divided into three parts: Matchbox, a three-part game of matching shapes, upper- and lowercase letters and numbers; Magic Blackboard, a drawing and coloring program where finished pictures can be saved on disk; and Heidi's Program, a flood of colors and sounds.

Making the selection process easier are icons that represent objects or tasks in the programs. For further information, contact Software Entertainment Company, 537 Willamette, Eugene, OR 97401. Reader Service number is 459.

### First Encounters

First Encounters teaches computer literacy in the elementary grades. The multi-media kit contains four card games, five keyboard charts, lesson board, worksheets, two program disks, ten mini-programs and teacher's guide for \$98. For more information, contact Educational Activities Inc., PO Box 392, Freeport, NY 11520. Reader Service number is 468.

### P-Lisp Now for the Apple

Lisp, a language frequently used in artificial intelligence programs, is now available in a new,

Circle 232 on Reader Service card

## Looking for software at Reasonable Prices?



Look no further —

### C & S Software

P.O. Box 366  
Sycamore, Ill.  
60178  
815-895-9155



Please send information on the following:

- Apple, IBM, TI
- Commodore, Atari
- 400/800 Computers

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Circle 200 on Reader Service card

ONLY  
**\$199**  
**HIGH SPEED**  
**CENTRONICS 101A**  
**DOT MATRIX LINEPRINTERS**

Fully Reconditioned  
Heavy Duty Steel Construction  
1980 List Price \$4800 Our Price \$199

- 165 Characters per second (1920 words per minute)
- 2" to 15" Adjustable Tractor Feed
- 132 Columns Expanded Print & Multi-strike Highlighting
- 9 x 7 Matrix with "End of Line" Seeking Carriage Return
- Optional Lower Case Character Sets with Graphics Available
- Compatible with Centronics Parallel Outputs: (TRS-80, Apple, IBM-PC, Franklin Ace, Osborne, Atari, TI-99, Commodore 64, Vic-20, and More)

### BRAND NAME COMPUTERS AND PRINTERS

New in stock at competitive prices.

Send for price list.

### A.C.E. SYSTEMS

106 E. BROAD ST. BETHLEHEM PA 18018  
215-867-5066

## New Software



Five new educational programs from The Learning Company.

faster version for the Apple P-Lisp version 3.2 features full floating-point mathematics, hi-res graphics and over 70 built-in functions. The P-Lisp package, at \$99.95, includes the book *Learning Lisp*, as well as the interpreter and manual. Contact GNOSIS Inc.,

4005 Chestnut St., Philadelphia, PA 19104. Reader Service number is 453.

### Discovery Learning Programs

New learning programs from The Learning Com-

pany teach reading, number, logic, problem solving and art skills. Reader Rabbit and the Fabulous Word Factory (\$39.95) teach pre-reading and early reading skills to children aged five to seven.

Word Spinner (\$34.95) takes readers on a whirl

through the alphabet to learn the building blocks of reading. In building more than 500 three-letter and 1000 four-letter words, children learn to recognize word patterns and develop critical vocabulary and spelling skills.

Animated dice are used in Number Stumper (\$39.95) to solve basic addition and subtraction equations and develop abstract reasoning and strategic thinking skills.

Children learn the basic concepts of addition and flexible thinking about numbers with Addition Magician (\$34.95), a fast paced number strategy game.

Colorasaurus (\$29.95), a

Circle 12 on Reader Service card.

### ADALAB™ Automates Lab Instruments



For Less Than  
**\$3400\***

• Interactive Microware's general-purpose ADALAB™ data acquisition and control system interfaces with virtually any lab instrument using a recorder or meter, including GC and HPLC systems, spectrophotometers, pH meters, process control apparatus, thermocouples, etc.

• Lab Data Manager™ software facilitates single or multi-channel acquisition, storage, display and chart recorder style output of lab instrument data. IMI QUICKI/O software operates within easy-to-use BASIC!

• Thousands of scientists currently use IMI software and/or ADALAB products worldwide!

\*Price includes 48K APPLE II+ CPU, disk drive with controller, 12" monitor, dot matrix printer with interface, IMI ADALAB™ interface card.

†Trademark of Apple Computer, Inc.

### IMI'S ADALAB INTERFACE CARD IS AVAILABLE SEPARATELY FOR ONLY \$495

(Includes 12-bit A/D, 12-bit D/A, 8 digital sense inputs, 8 digital control outputs, 32-bit real-time clock, two 16-bit timers plus QUICKI/O data acquisition software.)

Attention  
APPLE  
Owners



INTERACTIVE MICROWARE, INC.  
P.O. Box 771, Dept. 52  
State College, PA 16801 (814) 238-8294

Circle 62 on Reader Service card.

### COOL-AIDE™

SUPER COOLING FAN  
TRANSIENT VOLTAGE PROTECTION  
RFI/EMI FILTERING  
FOR APPLE II\* COMPUTERS  
**\$59.95**



### Features

- Thin, compact design, easy installation, just clips on
- Compatible with Apple standard computer case
- Entire system controlled by front power switch, 120/60 operation
- Internal voltage surge protection & RFI/EMI filtering
- Power indicator light & dual auxiliary outlets
- Quiet and efficient operation
- Reduce heat build up, moves 37 CFM of air

Also available from Kalgo Electronics Co. Inc.:

AEGIST™ Power Conditioning Equipment  
SPIKE-SPIKER™ - Transient voltage protectors & noisefilter  
from \$34.95-\$94.95

LINE-SAVER™ - Uninterruptable Power Systems - from \$395.00

SEND FOR FREE LITERATURE



KALGO®

6584 Ruch Rd., Dept. I  
Bethlehem, PA 18017

DIAL FOR OEM INQUIRIES INVITED

Pa. Res. add 6% sales tax  
for COD add \$3.00 + shipping

\*Reg. trademark of Apple Computers Inc.

## New Software

new type of coloring book for young computer artists, teaches color discrimination, matching and memory skills with colorful dancing dinosaurs in a volcanic world.

For further information, contact The Learning Company, 545 Middlefield Road, Suite 170, Menlo Park, CA 94025. Reader Service number is 458.

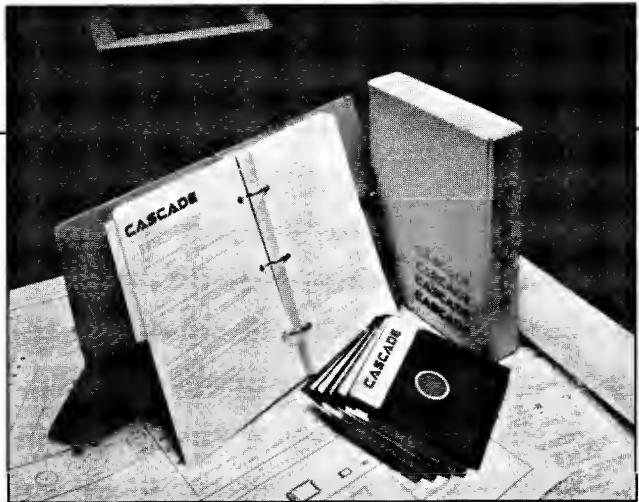
### Sorcerer

Sorcerer, the second release in Infocom's Enchanter series of adventures, offers an even greater challenge than previous adventures. A richly-detailed history and geogra-

phy as well as a vocabulary of more than 1000 words make this interactive fiction game a real buy at \$49.95. For more information, contact Infocom Inc., 55 Wheeler St., Cambridge, MA 02138. Reader Service number is 469.

### Low-cost CAD

A low-cost (\$895) computer aided design system, Cascade I includes a cursor stabilizer and software for the Apple II Plus and IIe. Cascade I can place as many as 255 different overlays on the system and display each of them independently, which makes it ideally suited for construc-



Low-cost CAD program.

tion drawings for multi-story buildings.

Other features are the ability to group and move objects into a conglomerate, panning and zooming to view objects outside the drawing area. Both aligned, directional and multi-di-

rectional text are incorporated into drawings. The software will power plotters of up to 24-by-36 inches. Contact Cascade Graphics Inc., 1000 South Grand Ave., Santa Ana, CA 92705, for more information. Reader Service number is 463.

Circle 270 on Reader Service card.

## This Prescription Will save the life of your VISICALC !

- Don't Buy a New Machine to Run it On
- Don't Buy a New Spreadsheet Program



### BUY VISICALC ENHANCERS from SOLUTIONS

"Saves me many hours, every time I run long reports"  
October 1983 Popular Computing

"Sort does exactly what it promises"  
InfoWorld September 5, 1983

**SYMPTOM:** Desperate need to sort the rows or columns of a VisiCalc spreadsheet

**Rx:** SORT™ from SOLUTIONS

**SYMPTOM:** Bleary Eyes from trying to print a good looking report from VisiCalc

**Rx:** REPORT™ from SOLUTIONS

### SORT

- Sort the rows or columns of your VisiCalc spreadsheet
- Formulas and values move with each row or column
- Sort alphabetically or numerically
- Sort in ascending or descending order
- Use up to four additional keys to break ties or specify secondary sorts

Both are Available for TRS-80®  
Models I/II/12/16, III, Apple® II+,  
IIe, III with business basic and for  
the IBM PC™ and compatibles.

### REPORT

- Print with variable width columns
- Segment large spreadsheets into multipage reports
- Repeat columns and rows and multipage reports
- Eliminate unwanted columns
- Align decimal points
- Center or justify labels and values
- Add titles and page numbers to your report
- Write reports to disk for later printing or transmission

### Solutions, Inc.

13 State Street, Box 989, Montpelier, Vermont, 05602. Telephone (802) 229-0368

Send me a Free Brochure

PLEASE SEND ME THE FOLLOWING SOFTWARE

SORT \$89.00       REPORT \$79.00

Send me BOTH SORT and REPORT for \$168.00  
ALSO AVAILABLE: (SAVE \$10)

Dow Jones Spread Sheet Link \$249.00  
 GL Bridge \$195.00

Include \$4.00 for U.S. shipping and handling.

Computer Model \_\_\_\_\_

Check or Money Order Enclosed

Charge My Credit Card  Visa  MasterCard

Card no. \_\_\_\_\_ Exp. Date / \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

# New Products

edited by Joan Witham

## Printer Buffer with 64K Memory

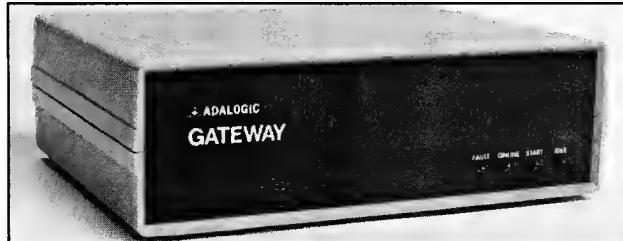
The Model 500 features a Centronics-compatible parallel interface, expandable memory to 256K, multiple copy function up to 255 copies and pause function to temporarily halt data output. The suggested retail price is \$325 from Taxan Corp., 18005 Cortney Ct., City of Industry, CA 91748. Reader Service number is 472.

## Elevate Your Printer

A solid steel enamel-finished stand for elevating mini-printers is available in two models from Bretford Manufacturing Co., 9715 Soreng Ave., Schiller Park, IL 60176. Model WSPS-1 (\$32) elevates a mini-printer with a 9½-inch paper feed and accommodates a continuous flow of paper. The WSPS-2 mini-printer stand (\$43) is for larger mini-printers with a 15-inch capability. A slot accommodates bottom feed printers in both stands. Reader Service number is 486.

## Classic Computing Style

The Jr. Executive computer roll top desk, for the professional and home computer user, has four security locks to prevent tampering and system theft, an automatic power shut-off feature and a removable ventilated rear panel to facilitate system hook-up and heat dissipation. Suggested retail price is \$1175 from Highland Three Inc., PO Box 795003, Dallas, TX 75379. Reader Service number is 487.



*Gateway computer security device.*



*The WSPS-1 and -2 mini-printer tables are made of solid steel.*



*The Jr. Executive computer roll top desk.*

## Give the Password

Gateway, a stand-alone computer security device for use on dial-up or leased lines, provides protection against computer intruders. The user must enter both the correct ID code and password within three attempts and a defined time limit. Gateway connects between the modem and the host computer to any RS-232 full duplex port and operates at 300 or 1200 baud on dial-up lines. Gateway is available for \$395 from Adalogic at 1522 Wisteria Lane, Los Altos, CA 94022. Reader Service number is 489.

## The Australian Vision

Vision-80 Pty. Ltd., an Australian firm, has introduced cards to expand the capabilities of the Apple II and IIe. The Vision-80 board (\$195) plugs into slot 3 and displays 80 columns as well as 128 upper- and lowercase characters and a set of line and block graphics characters.

The Vision-128/256 Memory Expansion Card (\$295) is available as a basic 128K RAM memory expansion card and can be expanded to 256K RAM. The card is fully buffered, allowing lower power consumption and greater reliability.

For further information, contact Cunningham & Walsh Inc., 260 Madison Ave., New York, NY 10016. Reader Service number is 478.

## Inexpensive Printer Interface

UniPrint is a parallel interface card that is compat-

## New Products

Circle 380 on Reader Service card.

ible with the Apple II Plus, IIe and a wide variety of printers. The \$89 purchase price includes a Centronics-compatible cable and such features as graphic transfers of hi-res pages one or two, expansion, contraction and rotation of images and also color transfers on the Prism printer. Contact Videx Inc., 1105 N.E. Circle Blvd., Corvallis, OR 97330, for more information. Reader Service number is 471.

### SoundTrap Quiets Noisy Printers

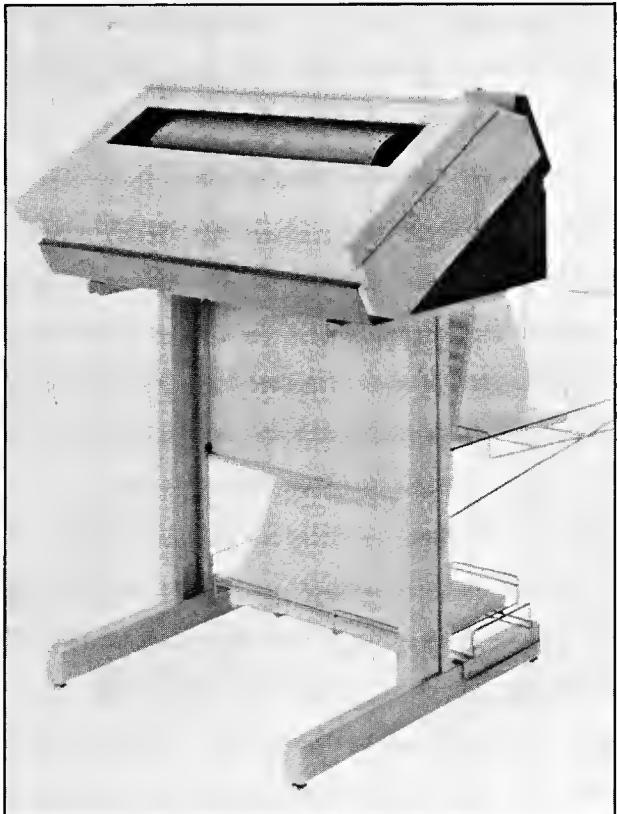
Trace Systems Inc. continues its battle against printer noise by introducing SoundTrap 136, a larger updated acoustical enclosure that quiets 136-

column dot-matrix printers and smaller letter-quality printers. SoundTrap 136 also doubles as a copy stand, reduces paper clutter and efficiently uses desktop space. Suggested retail price is \$229 from Trace Systems Inc., Mountain View, CA 94042. Reader Service number is 473.

### Two Multifunction Boards

Two boards transform Apple II systems into a signal averager, an autocorrelator and an analyzer of spectrums, histograms, and waveforms. They also provide for multiple sweep displays.

The APL-D2 is an 8-bit, dual channel module that features a 1024 point memory and a maximum sam-



SoundTrap 136 quiets noisy printers.

## \*REDUCES DISKETTE COST 50%! DOUBLES DISKETTE STORAGE SPACE



Owners of 5 1/4 "single "read/write" head disk drives can immediately double diskette storage space by using **NIBBLE NOTCH I** or **II**. The back of a single sided diskette is burnished. To use it you need a "write enable notch," and some also need in addition, an "index hole." **NIBBLE NOTCH I** and **II** are precision engineered tools designed exclusively for this purpose.



(Cuts square Write Enable Notch) For users of Apple, Franklin, Atari, Commodore and most other soft sectored systems.

only \$14.95 each  
add \$1.50 each P&H / (\$4.50 foreign P&H)

### NIBBLE NOTCH II

(Cuts square Write Enable Notch and 1/4 inch round "index hole") for owners of IBM, TRS 80 I & III, Osborne, Kaypro and others needing "index hole", and all other "hard sectored" systems.

only \$21.90 each  
add \$2.50 each P&H / (\$6.50 each foreign P&H)  
\*Florida Residents Add 5% Sales Tax\*

### • IT'S A MONEY SAVER! •

Dealer inquiries are invited.

## ORDER TODAY!

SEND CHECK OR MONEY ORDER TO:

**NIBBLE NOTCH™**

DIVISION OF CORTRAN INTERNATIONAL

4211 N.W. 75 TERRACE • DEPT. 21 • LAUDERHILL, FL 33319

ALL TRADEMARKS ARE ACKNOWLEDGED

Circle 306 on Reader Service card.

**MICROTUTOR™**  
**AN EDUCATIONAL EXPERIENCE**

- Teach or quiz students, children, employees or yourself on subjects of your own choosing.
- Print tests or test masters with random questions.
- Order yours today for only \$99.95-\$59.00

**ARITHMETIC™**  
**A LOT OF DRILL FOR THE DOLLAR**

- Define addition, subtraction, multiplication and division problems with numbers up to ten million.
- Get a better understanding of decimals and signed numbers.
- Order this impressive program now for only \$29.95.

**LOCUS SYSTEMS**  
P. O. Box 248  
N. WILKESBORO, NC 26659  
(919) 838-4114

MasterCard  
VISA

\*APPLE II DOS 3.3  
48K Memory  
1 or 2 Disk Drives

INCLUDE \$2.00 FOR SHIPPING  
(NC RESIDENTS ADD 4% SALES TAX)

DEALER INQUIRIES WELCOME

## GETTING LOST IN ADVENTURELAND???

*Get On The Right Path With The  
QUICK-DRAW  
ADVENTURE MAPPER*

Stop adventuring on the back of an envelope! A valuable companion to any adventure, QUICK-DRAW ADVENTURE MAPPER uses room titles, room connections, items and comments to produce an information summary and HIGH RESOLUTION map on your dot-matrix printer. It's the ultimate adventure utility. Compatible with Epson and Okidata printers, and Epson, Apple, Grappler, Orange, Microbuffer II/II+, Versa-Card, IS Pkaso, Dumpling and Mt. Computer CPS interface cards. Adaptable to any printer or interface card.

\$39.95

**BUBBLE HEAD**...Fast paced arcade game with 16 mazes, force fields, and trick doors.

\$19.95

**Special Offer—Both for \$49.95**

**Tellus Systems, Inc.**  
P.O. Box 96588  
Houston, Tx. 77213  
(713) 455-2191

**Visa/Mastercard Accepted**  
Add \$3 For Handling

**Apple II/II+/IIe**  
48 K RAM, Dos 3.3

Circle 335 on Reader Service card.



**KIDS' CORNER™**  
Quality educational software  
for young children

### INTRODUCING: LETTERS AND FIRST WORDS

From the **KIDS' CORNER**, an exciting new program by the developers of LEARNING ABOUT NUMBERS and MAGIC CRAYON:

**LETTERS AND FIRST WORDS:** colorful graphics help children identify letters, recognize associated sounds and spell simple words.

- "A-B-C"
- "Letter Sounds"
- "Building Words"

provide a logical progression of activities for learning about letters and first words.

Includes complete documentation and comprehensive management system.

For preschoolers to 2nd graders. **\$40**

Send for free brochure



© C & C Software  
5713 Kentford Circle  
Wichita, KS 67220  
(316) 683-6056

VISA and Mastercard accepted. Software for 48K Apple II Plus and Apple //e. Apple is a registered trademark of Apple Computer Co.

## New Products

pling rate of 3.5 MHz in the single channel mode.

The APL-HR14 is a 14-bit, single channel module with a 2048 point buffer memory and a maximum sampling rate of 500 KHz. For more information, contact R.C. Electronics, 5386 Hollister Ave., Santa Barbara, CA 93111. Reader Service number is 491.

contact HSP Computer Furniture, PO Box 5545, Birmingham, AL 35207. Reader Service number is 491.

### Convenient Outlet

The Micro Saver, an outlet strip, has surge protection and line noise filtering. It also comes with an easily installed bracket to mount it underneath the desk or table where it is conveniently at your fingertips while computing. Other features are a 9-foot sign cord and a lighted recessed power switch. Micro Saver is UL listed and

### Own a Winner

The Winner is an ergonomically-designed piece of computer furniture. Features include mobility and adjustable shelf and height. For further information,



*The Winner is completely mobile and adjustable.*

## New Products

its circuitry conforms to IEEE standards. Suggested retail price is \$69.95. For more information contact Kensington Microware, 251 Park Ave. South, New York, NY 10010. Reader Service number is 483.

### Spin a Computer Web

Useful for networking multiple computers to printers, modems, plotters or any RS-232 devices, SpiderNet is a Z-80 based intelligent switching system. It selects baud rates from 300 to 19.2K to match your transmission rate. It also has a time of day and date clock. SpiderNet is available for \$500 from Artisoft Inc., PO Box 41436, Tucson, AZ 85717. Reader Service number is 485.

### POPCOM Is Here!

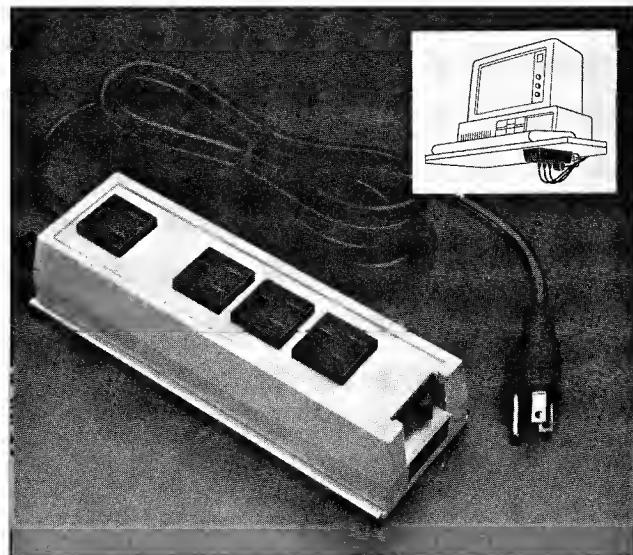
POPCOM Model XI00, a personal communications modem, features true voice

and data switching at your workstation, complete call progress monitoring, and detection of dial tones, busy signals, remote ringing, voice, data and line current disconnect. Installation is on the wall, desk or floor. No switches or indicators to adjust, compatibility with current communications software packages, and adaptability to a variety of RS-232 interface cables make it easy to install and use.

Suggested price is \$475 from microcomputer dealers or Prentice Corp., 266 Caspian Drive PO Box 3544, Sunnyvale, CA 94088. Reader Service number is 474.

### 68000 Development System

EMS has introduced a hardware/software package that allows the development and debugging of M-68000 programs using existing Apple II computer systems. The hardware consists of a stand-alone



POPCOM is a new advanced design modem.

# WANTED

"Buyers, & We'll pay the shipping"

• CALL FREE (800) 654-4058.

"Call For Reduced Prices At Various Quantities"

### Verbatim.

5 1/4" sin-side dbl-den.	<b>2<sup>40</sup></b>
5 1/4" dbl-side dbl-den.	<b>3<sup>45</sup></b>
5 1/4" sin-side quad	<b>3<sup>20</sup></b>
5 1/4" dbl-side quad	<b>4<sup>20</sup></b>
8" sin-side sin-den.	<b>2<sup>75</sup></b>
8" sin-side dbl-den.	<b>3<sup>05</sup></b>
8" dbl-side dbl-den.	<b>3<sup>40</sup></b>

Head Cleaning Kits	<b>5<sup>20</sup></b>
Refills	<b>9<sup>55</sup></b>

Prices per ea.  
10 per box

### Dysan CORPORATION

5 1/4" sin-side dbl-den.	<b>3<sup>20</sup></b>
5 1/4" dbl-side dbl-den.	<b>4<sup>20</sup></b>
5 1/4" sin-side quad	<b>4<sup>45</sup></b>
5 1/4" dbl-side quad	<b>4<sup>95</sup></b>
8" sin-side sin-den.	<b>3<sup>45</sup></b>
8" sin-side dbl-den.	<b>4<sup>45</sup></b>
8" dbl-side dbl-den.	<b>4<sup>95</sup></b>

We Stock "Bulk-Packed" Diskettes	<b>16<sup>75</sup></b>
----------------------------------	------------------------

### 3M Scotch

5 1/4" sin-side dbl-den.	<b>2<sup>20</sup></b>
5 1/4" dbl-side dbl-den.	<b>3<sup>20</sup></b>
8" sin-side sin-den.	<b>2<sup>35</sup></b>
8" sin-side dbl-den.	<b>2<sup>95</sup></b>
8" dbl-side dbl-den.	<b>3<sup>90</sup></b>

Disk Minder  
- Smoked Plastic  
- Holds 75 Disks  
**16<sup>75</sup>** ea

Dealer Inquiries Welcomed

the

**Diskette Connection**™

MasterCard  
PO Box 1674  
Bethany OK  
73008



\*(Continental U.S. only. Add 3<sup>00</sup> on orders under 40<sup>00</sup>)

Circle 88 on Reader Service card.

# Applesoft Programmers!

Software development made easier and quicker

### MUM ~ Macro Utilities Master

A disk of powerful macros and utilities which—

- Renumbers, shortens, merges programs
- Finds variables, strings, characters
- Measures free memory
- Inserts and deletes
- Generates datafiles and textfiles
- Lets you create your own macros

*Experience the power and friendliness of these routines for yourself*

**Only \$24.50**

HEYDEN & SON

Heyden & Son, Inc.  
247 S. 41st Street,  
Philadelphia, PA. 19104 (215) 382-6673

HEYDEN DATASYSTEMS

## New Products

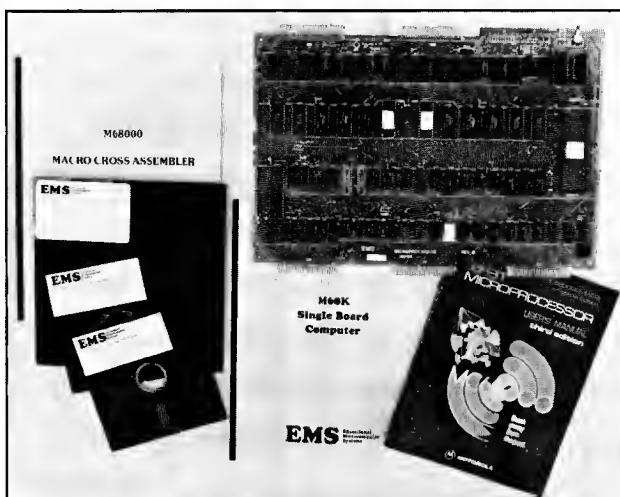
M68K single board computer, equipped with a 6MHz or 10 MHz M68000 CPU, 20K bytes of fast static RAM, 16K bytes of EPROM space, two RS-232 serial ports, a 16-bit parallel port, five 16-bit counter/timers and an expansion bus to allow for memory and I/O expansion.

The software consists of the M68KXAS Macro Cross Assembler which assembles the source files created by Apple II editor or word processor programs using standard M68000 mnemonics. The object file generated by the assembler is formatted to allow downloading to the next M68K SBC. The M68K de-

velopment package price starts at \$795 for a 6MHz version.

For more information, contact Educational Microcomputer Systems, PO

Box 16115, Irvine, CA 92713. Reader Service number is 490.



An affordable M68000 development system.

Circle 519 on Reader Service card.

### FREE? DISKETTES

SAVE MONEY! Apple II+e users can use the diskette flip side, if another "write enable" notch is correctly made.

The DISK-NOTCHER by QUORUM quickly SOLVES that PROBLEM. It's like FREE DISKETTES!

- Stainless Steel Guide
- Easy Leverage Handle
- Clippings Catcher
- Square Notch Cut
- Black Finish
- Get THE BEST!



### Certifix™

BE SAFE! Your 'FREE' disk is CERTIFIED 100% ERROR FREE with CERTIFIX by QUORUM. It 'LOCKS OUT' DISK FLAWS and lets you use the rest. Displays status report & saves it to disk. Next, CERTIFIX automatically formats then offers to initialize with genuine Apple DOS 3.3 too. Great for testing economy disks. CERTIFY, FIX & INITIALIZE every disk with CERTIFIX!

100% Money Back Satisfaction Guarantee!

DISK NOTCHER is \$14.95  
CERTIFIX™ is just \$24.95  
ONLY \$29.95 for BOTH!

Add \$1.50 s/h • CA add 6 1/2 % tax

QUORUM INTERNATIONAL, Unltd.  
INDUSTRIAL STATION P O BOX 2134-1C  
OAKLAND, CA 94614

Circle 376 on Reader Service card.

### Settle Your Bowling Scores "BOWL-KEEPER"

\$29.95

- Stores, Calculates and Prints
  - Individual games
  - Weekly series
  - Weekly average
  - Total pins
  - Cumulative average
  - Handicap (optional)
  - High series
  - High game
- Menu Driven
- League or Individual
- Applesoft Basic
- Unprotected
- Apple II+//Ile, Single Disk

Copies Bowlkeeper @ \$29.95 ea.

Total

5% Sales Tax (FL residents only)

\$2.00 Postage & Handling

Total Order

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Send Check or Money Order

To

SOFTWARE UNLIMITED

P.O. Box 6361

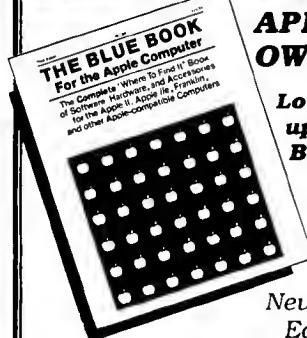
Clearwater, FL 33518

(C.O.D. Orders ONLY 813/797-7815)

Circle 246 on Reader Service card.

### APPLE OWNERS!

Look it up in the Blue Book



New Third Edition

• An up-to-date, where-to-find-it Directory for over 4,600 Apple software & hardware products.

• Names & addresses of more than 700 suppliers of Apple software - with detailed descriptions of available programs and how to order them.

• Over 900 pages! An essential reference for every Apple Owner!

#### PLEASE SEND ME:

copy/copies of **The Blue Book** • \$24.95 each  
 free catalog of Apple instructional books.

**ADD \$1.50 POSTAGE FOR FIRST BOOK,  
75¢ FOR EACH ADDITIONAL**

Make checks payable to:

**SINEQUANON  
P.O. Box 235, Cederhurst, N.Y. 11516**

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

## New Products

rate, temperature, and muscle activity, menu-driven software on a floppy disk and selectable feedback options. For further information, contact Thought Technology, 2180 Belgrave Ave., Montreal, P.Q., Canada H4A 2L8. Reader Service number is 488.

### Short Protection

An uninterruptible power supply has been announced by Transwestern Products Corp., 1711 Senter Road, San Jose, CA 95112. Ultraguard is an AC powered, battery back-up power source that gives up to 30 minutes of power, al-

lowing the user to safely save current work. The compact Ultraguard weighs

only 15 pounds, fits easily on or under a desk and provides 200 watts of uninter-



CALMPUTE 1 monitors your tension level.

Circle 164 on Reader Service card.

**LABEL YOUR DISKS WITH...  
The Disk Labeller**

The software interface displays a menu bar with "FILE", "EDIT", "FORMAT", "DISK", "HELP", and "ABOUT". A large window lists disk labels with their descriptions:

SEC FREE-296	SEC USED-298	MISCELLANEOUS
SORT FILE	PAYOUT	DOS 3.3
HI-RES GAM	SPACE GAME	ACCOUNT RE
FILESTRUCT	CARD GAMES	DATABASE
COPY PROGR	ACTION GAM	MAILING LI
DISK CHECK	PADDLE GAM	MEMO LIST
		CHECKBOOK
		DISK# DL01
		EXEC FILE
		TEXTWRITER
		FORM LETTER
		CORRESPOND
		MASTER FIL

**FEATURES:**

- AUTOMATIC LABELLING
- COMPLETELY MENU DRIVEN
- INCLUDES 300 5" LABELS

**REQUIRES:**

- 64K APPLE II/II+/IIe\*
- or EQUIVALENTS
- DISK DRIVE •PRINTER

SPECIAL PRICE \$59.95

SEND CHECK OR MONEY ORDER TO:

**PRACTICAL SOFTWARE LTD.**  
P.O. Box 64 Dept. IN Pomona, N.Y. 10970  
Phone: 914-425-1158

ADD \$3.00 SHIPPING & HANDLING - N.Y. RESIDENTS PLEASE ADD SALES TAX  
\*APPLE II/II+/IIe ARE REGISTERED TRADEMARKS OF APPLE COMPUTER, INC.

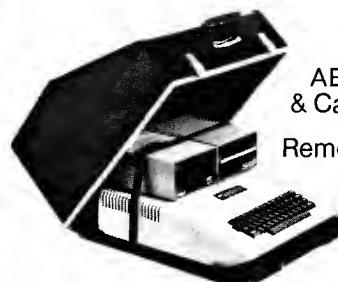


Ultraguard provides 30 minutes of emergency power.

ruptible power. The unit contains a rechargeable sealed battery, an automatic battery recharger, a solid state power inverter and complete overload and short protection. Ultraguard also provides voltage surge, transient and spike protection in its \$649 price. Reader Service number is 480.

Circle 161 on Reader Service card.

### Travel With Your Apple... Call (800) 847-4176!



ABS Storage  
& Carrying Case  
with  
Removable Cover  
**\$69.50\***

\*UPS Shipping Included.

Apple • IBM • Epson

Call for Complete Computer Case Catalog.  
Credit Card Customers Call Toll Free

**Fiberbilt**

Ikelheimer-Ernst, Inc.  
601 West 26th Street  
New York, New York 10001-1199  
(212) 675-5820 (N.Y. State)



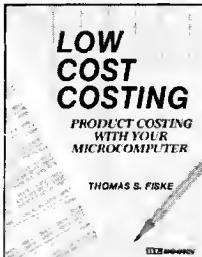
Gladly accepted

# CONTROL YOUR COSTS AND MAXIMIZE YOUR PROFIT

To make a profit, you have to know what your costs are. *Low Cost Costing* is a book-and-software combination that will help you determine production costs for your small business, using your Apple, IBM PC, or TRS-80.

If you are responsible for production, you can increase your profits once you know what you're spending. *Low Cost Costing* shows you how to analyze your costs using your profit-and-loss statements and your microcomputer. Once you've found them, you can:

- Cut your costs.
- Adjust prices.
- Set marketing and manufacturing strategies.
- Determine why some products sell and others don't.



It's the time- and money-saving combination your small business needs—*Low Cost Costing* and your micro.

## Low Cost Costing

Thomas S. Fiske  
approx. 112 pp.  
\$24.97

**TRS-80 Model I, III**  
CC7403 (package)  
ISBN 0-88006-072-7

**Apple II, II Plus, IIe**  
CC7399 (package)  
ISBN 0-88006-067-0

**IBM PC**  
CC7402 (package)  
ISBN 0-88006-071-9

To order, call toll-free 1-800-258-5473 for credit card orders. Or mail your order with check or money order or complete credit card information to: Wayne Green Books, Retail Sales, Peterborough, NH 03458. Please include shipping and handling of \$1.50 for the first system, \$1.00 for each additional system. Orders payable in US dollars only. Please allow 4-6 weeks for delivery.

Circle 110 on Reader Service card

**Yes,** I want *Low Cost Costing*, \$24.97 per system, plus shipping and handling (\$1.50 for the first system, \$1.00 for each additional system). Please indicate total number wanted for each system.

Apple (CC7399)  IBM PC (CC7402)  TRS-80 (CC7403)

payment enclosed  MasterCard  Visa  Am. Ex.

Card # \_\_\_\_\_ MC bank # \_\_\_\_\_

Expiration date \_\_\_\_\_ Signature \_\_\_\_\_

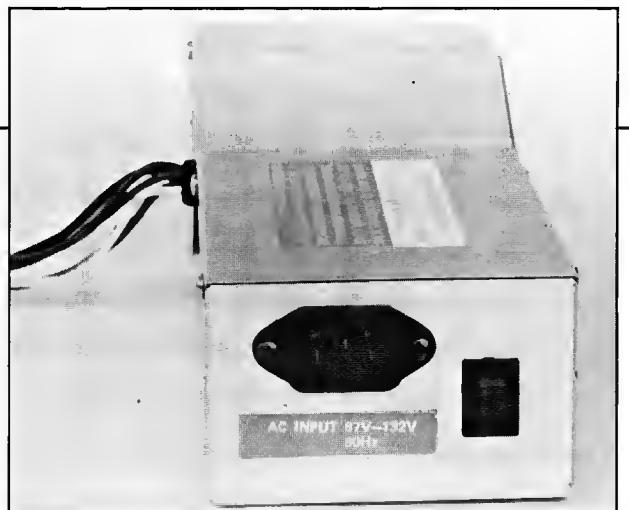
Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Wayne Green Books, Peterborough, NH 03458 345B5L

## New Products



Keep your Apple at an even temperature.

## Don't Fear Overheating

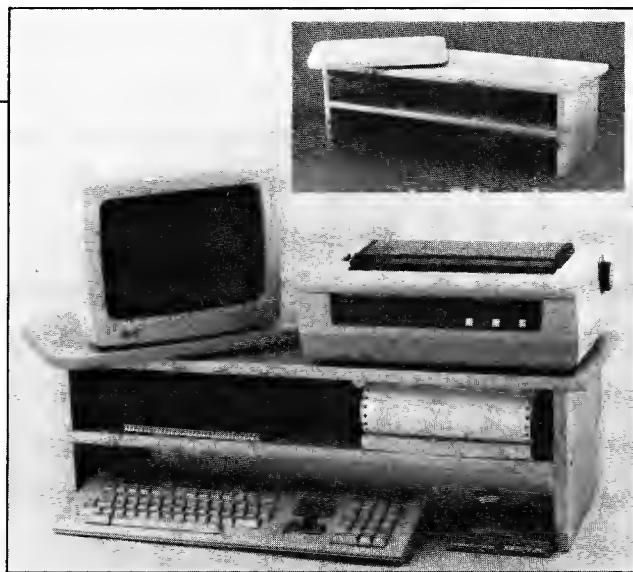
The DataSpec 5-Amp Switching Power Supply with built-in fan allows Apple II owners to add additional cards and peripherals without fear of overloading and overheating. The suggested retail price is \$169.95 from Alliance Research Corp., Northridge, CA 91328. Reader Service number is 482.

## Double Time Saver

Duodisk, a new floppy disk drive unit which contains two half-high 140-kilobyte drives side-by-side in a single case, was introduced by Apple Computer. Exactly the width of the Apple II, it can sit conveniently between the computer and monitor. The suggested retail price is \$795 for Duodisk and a



Duodisk contains two half-high drives side-by-side.

**New Products***Organize your computer with DeskMate.*

controller card. Contact Apple Computer Inc., 10260 Bandley Drive, Cupertino, CA 95014, for further information. Reader Service number is 470.

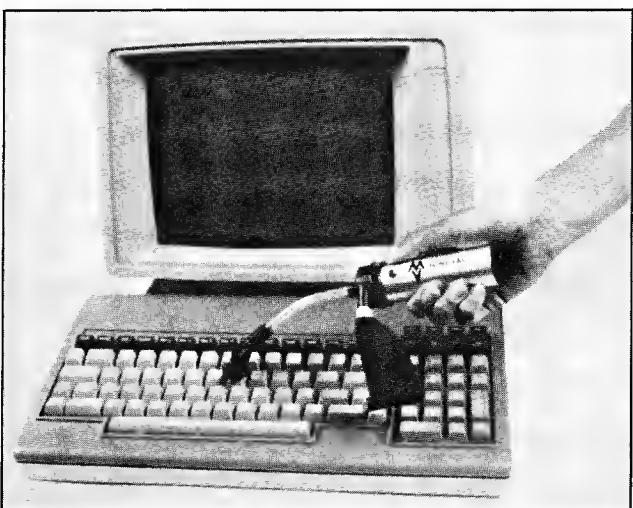
**Organize Your Computer**

The DeskMate, a ready-to-finish desk-top organizer, holds all popular brands of computers, turning any desk or table into a computer work station. It features a turntable shelf for the CRT which rotates a full 360°, space for a

printer and a shelf for fan-fold paper with a slot to the printer above. Made of solid pine, the DeskMate assembles easily to make a sturdy unit. DeskMate sells for \$44.95 plus \$5 S/H from Holliscraft, PO Box 465, Oakdale, MA 01539. Reader Service number is 484.

**For a Cleaner Computer—  
Vacuum It with Mini-Vac**

Mini-Vac is a lightweight, quality constructed vacuum cleaner designed to remove minute

*The powerful micro-cleaner with the delicate touch.***CIRCUIT DESIGN MADE EASY**

Use your microcomputer and *Programs for Electronic Circuit Design* to help you select the correct value for each component in an electronic circuit. The programs are adaptable to most microcomputer systems and are also available on disk for the Apple, IBM PC and TRS-80. The thirteen programs can be used individually, or they can be combined, using a master menu, as explained in the book.

Topics covered include:

- resistor, capacitor and inductor circuits
- circuits that have combinations of resistors, capacitors and inductors
- series and parallel circuits
- voltage dividers
- impedance and frequency
- phase angles
- operational amplifiers
- transistor circuits

*Programs for Electronic Circuit Design*

David Leithauser

\$14.95 ISBN 0-88006-068-9

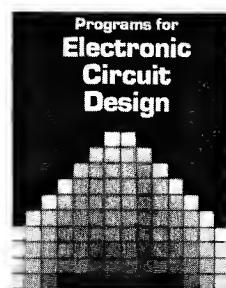
softcover 7 by 9 approx. 100 pp. I984 BK7400

Book and Disk Packages \$24.97

Apple II, II+, IIe CC7400II, ISBN 0-88006-079-4

IBM PC CC7400I2, ISBN 0-88006-080-8

TRS-80 Model I/III CC7400I3, ISBN 0-88006-081-6



To order, call toll-free 1-800-258-5473 for credit card orders. Or mail your order with check or money order or complete credit card information to: Wayne Green Books, Retail Sales, Peterborough, NH 03458. Please include \$1.50 for the first item and \$1.00 for each additional item for shipping and handling. Wayne Green Books are also available in book stores. Orders are payable in U.S. dollars only. Please allow 4-6 weeks for delivery. Dealer inquiries invited.

Send me \_\_\_\_\_ copies of *Programs for Electronic Circuit Design* (BK7400) at \$14.95 each. Send me \_\_\_\_\_ packages for the Apple II, II Plus, IIe (CC7400II); \_\_\_\_\_ packages for the IBM PC (CC7400I2); \_\_\_\_\_ packages for the TRS-80 Model I/Model III (CC7400I3) at \$24.97 each. Shipping and handling is \$1.50 for the first item; \$1.00 for each additional item.

Card # \_\_\_\_\_ Expiration date \_\_\_\_\_

payment enclosed    MasterCard    Visa    Am. Ex.

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Wayne Green Books, Peterborough, NH 03458

345B5P

## New Products

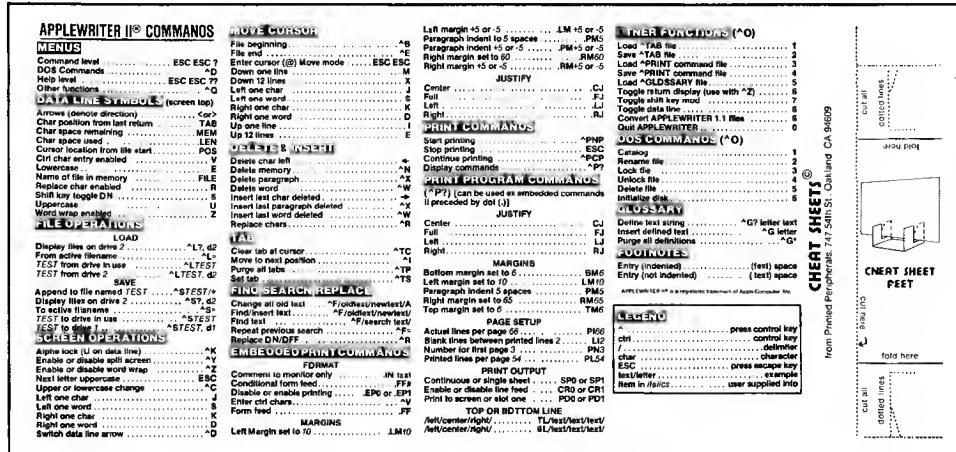
particles of dust and debris from hidden and hard-to-reach areas. The unit is equipped with two interchangeable wands, two

fine bristle brushes, and a cloth vacuum bag. The motor is DC powered with a 9-volt battery (not included). Send \$29.95 plus \$2

S/H to The Pine Cone, PO Box 1378, Gilroy, CA 95020, for your micro-cleaner. Reader Service number is 481.

### Cheat Sheet

Cheat Sheets are command summary cards designed to perch atop your screen and jog your memory for WordStar, VisiCalc and AppleWriter II. These heavy-gauge non-glare vinyl cards are available for \$9.95 from Printed Peripherals, 747 54th St., Oakland, CA 94609. Reader Service number is 479.



Cheat Sheets save time and trouble.

Circle 512 on Reader Service card.

**AT WITT'S END?** Thousands of people have had the unpleasant experience of being stumped by an adventure, whether it be in the complexities of an Infocom Interlogic™ experience or a limited one with a small vocabulary. Yet, you'll never be again, for we now produce Witt's Notes™ (complete hints and maps) for many of the adventures on the market.

Witt's Notes™ are not crib sheets, they are comprehensive booklets which try to analyze every potential problem that an adventurer might encounter. Yet, we can assure you that, if used properly, our hint booklets should never give away unwanted answers.

Currently, select from these popular titles: **Sherwood Forest, Kabul Spy, Blade of Blackpool, Critical Mass, Colossal Cave, The Quest, Transylvania, Coveted Mirror, Mystery House, Wizard, Cranston, Ulysses, Time Zone, Dark Crystal, Mask of Sun, Serpent's Star, Zork (I, II, or III), Deadline, Starcross, Witness, Suspended, Planetfall, Enchanter, Infidel** and many more. Best of all, each is only \$5.95. Dealer inquiries invited. CT residents add 7½% sales tax.



**WITT'S END**  
42 Morehouse Rd.  
Easton, CT 06612

Interlogic is a trademark of Infocom, Inc.  
Witt's Notes is a trademark of Witt's End Assoc.

Circle 92 on Reader Service card.

## HEALTHY COMPUTING! : TOTAL FITNESS PROGRAMS

Your computer can help you and your loved ones live longer and enjoy life more.

Call or send for a FREE catalog of health-related programs:

- \* Diet/Nutrition
- \* Exercise/Aerobics
- \* Health Education
- \* Self-Improvement
- \* Psychology
- \* Games

Programs for all ages!

**CTRL Health Software**  
18653 Ventura Blvd., # 348  
Tarzana, CA 91356  
(818) 788-0888

## ATTENTION

Foreign Computer Stores/  
Magazine Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that The Wayne Green Publications Group provides.

Provide your audience with the magazine they need and make money at the same time. For details on selling Microcomputing, 80 MICRO, in-Cider, HOT CoCo, RUN, jr and Wayne Green Books contact:

**SANDRA JOSEPH**  
**WORLD WIDE MEDIA**  
386 PARK AVE., SOUTH  
NEW YORK, NY 10016  
PHONE (212) 686-1520  
TELEX—620430

ley Ave., Winchester, VA 22601. Their products include a Grandstand letter-size copyholder (\$20.95), CRT tray (\$10.95), Clear-Stat Mat (\$125) for a 45-by-53 inch antistatic surface, and a Mini/Micro Cassette File (\$15.95). Reader Service Number is 475.

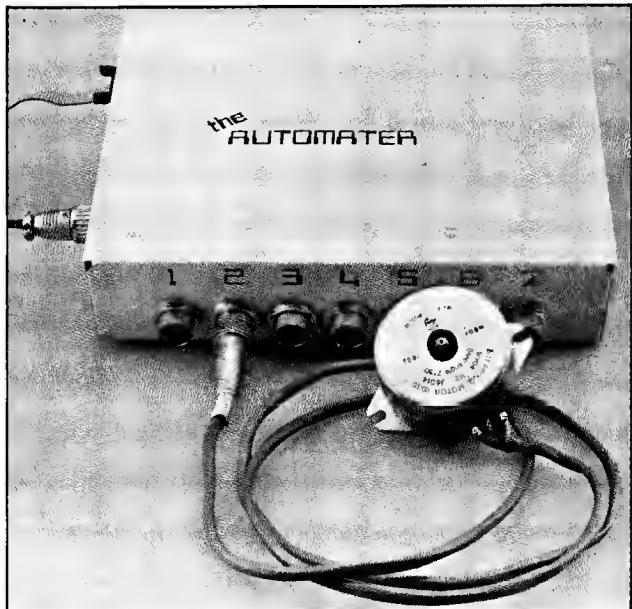
### Automater/Armdroid 1 Robotic Arm

The Automater (\$287.28) allows users to design their own applications for automation and computer interfacing to the mechanical world. Programs are available for the Apple II, II Plus and IIe that repeat a

sequence as required. A set of instructions for set-up, interfacing and operation is part of the unit, along with electronics schematics, board layout, basic software listing and description.

The Armdroid 1 Robotic Arm (\$1295 assembled) can be used as a handling device or a computer peripheral. It uses several joints at once and performs a programmed move sequence under computer control. The robot comes either as a kit or in assembled form.

For further information, contact O&M Computing Inc., Box 2102, Fargo, ND 58107. Reader Service number is 477.



*The Automater is a step toward automation education.*

## *What would you do with 1.000.000 customers?*

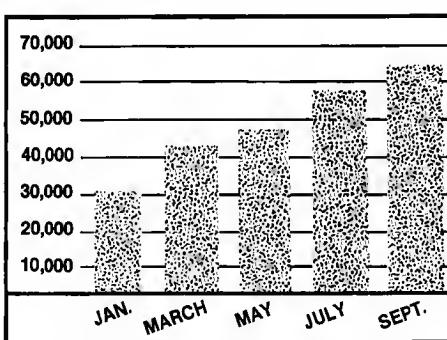


Sell *inCider* and you'll tap into a tremendous market. Over one million Apple\* computers have been sold so far. And every Apple owner is looking for the kind of practical help *inCider* provides.

Of course, you won't see all of those one million customers in your store. But those that do come in are likely to become regular customers.

The type of customers you can always use more of. Our average reader is 34 years old, college educated, and earns about \$43,200 a year.

Look at the graph to see how your sales may improve.



In the last nine months, *inCider*'s newsstand sales have nearly doubled.

\*Apple is a registered trademark of Apple Computer Inc.

Selling *inCider* is easy to do. We offer:

- liberal dealer discounts
- six-month, full-refund returns
- a toll free number for assistance
- a colorful poster to spur sales

Call Ginnie Boudrieau, our Retail Sales Manager, to place your order today!

**1 (800) 343-0728**

In NH call (603) 924-9471

Or write to her at: *inCider*, 80 Pine Street, Peterborough, NH 03458.

## *Sell inCider.*

# Index to Advertisers

Reader Service	Page No.	Reader Service	Page No.	Reader Service	Page No.
200 A.C.E. Systems .....	149	92 Health Software .....	160	268 Prometheus Products .....	7
501 Abacus/CompuSource .....	71	88 Heyden & Son .....	155	274 Protecto Enterprises .....	93, 94, 95
26 Action-Research Northwest .....	135	466 Heyden & Son .....	148	456 Quark Inc. ....	147
489 Adalogic .....	152	229 High Order Micro Electronics .....	122	16 Quinsept Inc. ....	139
168 Addmaster Corp. ....	114	487 Highland Three Inc. ....	152	519 Quorum .....	156
460 Alliance Research Corp. ....	158	484 Holliscraft .....	159	476 R.C. Electronics .....	153
* Apple Computer .....	25	405 Hollywood Hardware .....	73	* RCM Software .....	141
470 Apple Computer .....	158	398 Holmes Enterprises Inc. ....	138	464 Reader's Digest Software .....	148
24 Appleware Inc. ....	138	491 HSP Computer Furniture .....	154	309 Rising Sun Software .....	129
509 Apple-Pi Micro .....	147	304 Human Systems Dynamics .....	57	475 Rubbermaid .....	160
* Applied Engineering .....	123, 141	419 Human Systems Dynamics .....	67	140 Rule One .....	145
485 Artisoft Inc. ....	155	inCider Magazine .....		Run Magazine .....	36
179 Beagle Bros. Microsoft .....	88, 89	Advertising Ad .....	141, 146	* Safeware .....	69
* Beck Manufacturing .....	60	Back Issues .....	145	526 Select Software Inc. ....	80
344 Bill Cole Enterprises .....	79	Dealer Ad .....	161	* Sensible Software .....	48
* Bottom Line .....	14, 15	Foreign Dealer .....	160	460 Signum Microsystems .....	146
486 Bretford Manufacturing Inc. ....	152	Mailing List .....	146	246 Sinequan .....	156
* Business Computers of Peterborough .....	37	Subscriptions .....	98	218 Sir-Tech .....	3
455 Business Solutions Inc. ....	147	Subscription Problems .....	145	292 Software Banc Inc. ....	140
284 Byte General Inc., The .....	55	469 Infocom Inc. ....	151	459 Software Entertainment Co. ....	149
6 Bytes & Pieces .....	131	12 Interactive Microware .....	150	* Software Support .....	143
335 C & C Software .....	154	162 J & M Software .....	45	376 Software Unlimited .....	156
232 C & S Software .....	149	jr Magazine .....	34	270 Solutions Inc. ....	151
233 Calcshop .....	133	62 Kalgo Electronics Co. Inc. ....	150	103 Southern Center for Res. Inn. ....	107
* Caribbean Computer Sales .....	128	86 Kensington Microware .....	9	67 Stellation Two .....	114, 145
463 Cascade Graphics Inc. ....	151	483 Kensington Microware .....	154	461 Strategic Simulations Inc. ....	147
361 Central Point Software .....	115	511 Keytronics .....	27	355 Street Electronics .....	68
451 Chalk Board Inc. ....	149	450 LJK .....	144	82 Strictly Software .....	81
316 CMA/Charles Mann & Assoc. ....	148	306 Locus Systems .....	153	156 Sublogic Communications Corp. ....	49
427 Computer Learning Center .....	101	* MacWorld .....	51	517 Such-A-Deal .....	113
254 Computer Outlet .....	91	56 Midwest Software .....	92	525 Swenson Assoc. Inc. ....	70
* Computer Plus .....	148	396 Manx Software Systems .....	65	370 Syntex Micro Products .....	105
269 Coosol Inc. ....	136	462 MECA .....	144	472 Taxan Corp. ....	152
163 Core Concepts .....	147	356 Mega-Byte .....	114, 145	225 Tellus Systems Inc. ....	154
457 Core Concepts .....	146	208 Micro City/Pace .....	47	458 The Learning Co. ....	150
348 Craftsbury Software .....	133	352 Micro Design .....	75	481 The Pine Cone .....	159
332 David Data .....	133	467 Micro Lab .....	148	32 Thirdware/Precision Software .....	21
452 Datasoft Inc. ....	144	245 Micro Management Systems .....	112	488 Thought Technology .....	156
144 Davka Corporation .....	83	523 Micro Minds Unlimited .....	140	454 Three Sigma Inc. ....	144
3 Dennison Carter .....	Cover IV	204 Micro Works .....	137	129 Thunderware .....	23
367 Digital Images .....	145	134 Micro-Merchant .....	124	278 Titan Technologies .....	59
* Diskette Connection .....	155	371 Micro-Sci .....	53	473 Trace Systems Inc. ....	153
108 Diversified Software Research .....	132	465 Navic Software .....	148	480 Transwestern Products Corp. ....	157
247 Dorsett Educational Systems .....	74	177 Nibble .....	83	122 Troy Software Designs .....	40
34 Doss Industries .....	65	380 Nihble Notch .....	153	15 Troy Software Designs .....	139
30 Dow Jones News Retrieval .....	71	387 Nikrom Technical Products .....	134	402 TSK Electronics .....	17
215 East Side Software Co. ....	85	310 Northeastern Software .....	117	University Micros .....	145
362 Eastcoast Software .....	111	477 O & M Computing Inc. ....	161	264 Utilico Microware .....	122
468 Educational Activities Inc. ....	149	85 ohm Electronics/Scooter .....	63	182 Videx Inc. ....	41
490 Educational Microcomputer Systems .....	155	208 Pace/Micro City .....	47	471 Videx Inc. ....	152
404 Elek-Tek .....	46	31 Pacific Exchanges .....	145	478 Vision-80 Pty. Ltd. ....	152
* Fastrack Computer Products .....	76	187 Personal Computer Book Club .....	130	373 Voice Machine Communications .....	44
161 Fiberbilt .....	157	141 Pirate Harbor .....	125	Wayne Green Inc. ....	
139 FlexibleSoftware .....	45	164 Practical Software .....	157	112 Rainbow Quest .....	66
49 Frogg House/Prof. Jones .....	78	32 Precision Software/Thirdware .....	21	110 Low Cost Costing .....	158
453 Gnosis Inc. ....	150	474 Prentice Corp. ....	155	111 Programs Circuit Design .....	159
146 Golem Computers .....	119	186 Prentice Hall Inc. ....	11	Manuscript .....	140
66 H & E Computronics .....	Cover III	479 Printed Peripherals .....	160	529 Wesper MicroSystems .....	19
291 Hayden Book Company .....	96	49 Prof. Jones/Frogg House .....	78	393 Wholesale Technology, Inc. ....	145
51 Hayes Microcomputer Products .....	Cover II	521 Programs Plus .....	103	512 Witts End .....	160

\*This advertiser prefers to be contacted directly.

For further information from our advertisers, please use the Reader Service card.

# Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™



## The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

### VERSARECEIVABLES™

\$99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

### VERSAPAYABLES™

\$99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

### VERSAPAYROLL™

\$99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information or it. If desired, totals may be posted to the VERSALEDGER II™ system.

### VERSAINVENTORY™

\$99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

# COMPUTRONICS

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

\* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. • \*APPLE is a trademark of Apple Corp. • \*IBM is a trademark of IBM Corp. • \*OSBORNE is a trademark of Osborne Corp. • \*CP/M is a trademark of Digital Research. • \*XEROX is a trademark of Xerox Corp.

### VERSALEDGER II™

\$149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system without any additional software.

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

### SATISFACTION GUARANTEED!

Every VERSABUSINESS™ module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any VERSABUSINESS™ module, you may return it within 30 days for a refund. Manuals for any VERSABUSINESS™ module may be purchased for \$25 each, credited toward a later purchase of that module.

#### To Order:

**Write or call Toll-free (800) 431-2818  
(N.Y.S. residents call 914-425-1535)**

- \* add \$3 for shipping in UPS areas
- \* add \$4 for C.O.D. or non-UPS areas

- \* add \$5 to CANADA or MEXICO
- \* add proper postage elsewhere

#### DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.



# ENTER THE ELEPHANT SAFARI SWEEPSTAKES.

Circle 3 on Reader Service card

## GRAND PRIZE (1 winner)



An exciting two week adventure for two to a wild game preserve in Kenya, Africa. The trip includes airfare, luxurious accommodations, meals, tips, and taxes.

## SECOND PRIZE (25 winners)



A Bell & Howell 35mm camera. The 35J complete with fine Lumina lens completely eliminates complicated focusing.



## THIRD PRIZE (100 winners)

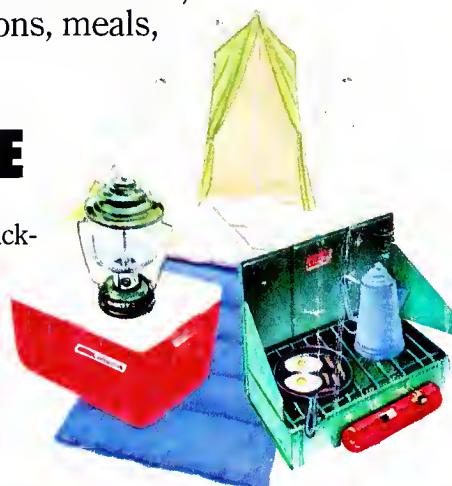
Camouflage

Nylon Duffle Bag. This handsome bag is water repellent and double reinforced at all stress points.

And thousands of Elephant Safari camouflage T-shirts featuring the Elephant logo.

## FIRST PRIZE (5 winners)

A Deluxe Camping Package featuring an 8' x 10' Wenzel Cabin Tent, four Wenzel sleeping bags, plus a Coleman lantern, stove and cooler.



## HOW TO ENTER

No purchase necessary. Just come into a participating Elephant Safari Sweepstakes dealership where you'll find free entry blanks and official rules. While you're there, check out our full line of quality Elephant memory disks and accompanying products. Entries must be received by July 31, 1984. Void where prohibited.

Dennison



For the Elephant dealer nearest you, call 1-800-343-8413. In Massachusetts, call collect 617-769-8150.

